United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with United States Department of Agriculture, Forest Service; North Carolina Department of Environment, Health, and Natural Resources; North Carolina Agricultural Research Service; North Carolina Cooperative Extension Service; Macon Soil and Water Conservation District; and Macon County Board of Commissioners

Soil Survey of Macon County, North Carolina

How To Use This Soil Survey

General Soil Map

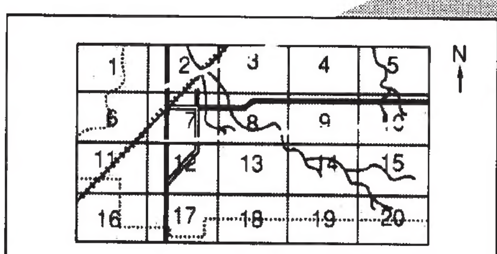
The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

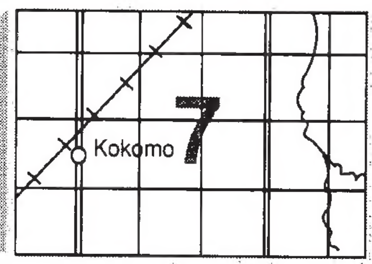
Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.

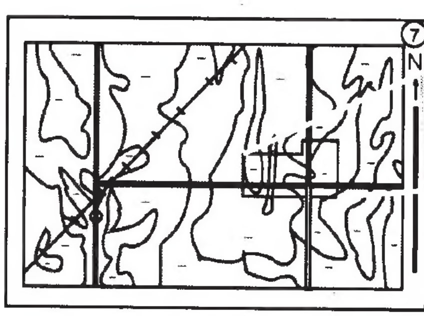


INDEX TO MAP SHEETS



MAP SHEET

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** (see Contents), which lists the map units by symbol and name and shows the page where each map unit is described.



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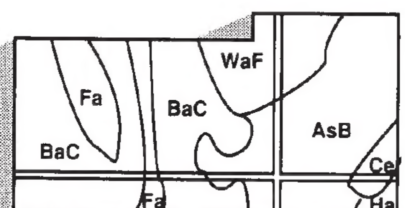

AREA OF INTEREST

NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the North Carolina Agricultural Research Service, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1988. Soil names and descriptions were approved in 1990. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1990. This soil survey was made cooperatively by the United States Department of Agriculture, Natural Resources Conservation Service; the United States Department of Agriculture, Forest Service; the North Carolina Department of Environment, Health, and Natural Resources; the North Carolina Agricultural Research Service; the North Carolina Cooperative Extension Service; the Macon Soil and Water Conservation District; and the Macon County Board of Commissioners. It is part of the technical assistance furnished to the Macon Soil and Water Conservation District. The Macon County Board of Commissioners provided financial assistance for the survey.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

An earlier soil survey of Macon County was published by the U.S. Department of Agriculture in 1956. This survey updates the previous survey, provides more detailed maps on aerial photographs, and contains more interpretative information *(9)*.

All programs and services of the Natural Resources Conservation Service are offered on a nondiscriminatory basis, without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

Cover: The Iotla Valley, which is one of the most intensively farmed areas in Macon County. The soils in the valley are in the Rosman-Reddies-Toxaway general soil map unit, and the soils on the mountains in the background are in the Evard-Cowee-Saunook general soil map unit.

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Issued May 1996

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Summary of Tables

Foreword

This soil survey contains information that can be used in land-planning programs in Macon County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the North Carolina Cooperative Extension Service.

Richard A. Gallo
State Conservationist
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Soil Survey of
Macon County, North Carolina

By Douglas J. Thomas, Natural Resources Conservation Service

Soils Surveyed by Douglas J. Thomas and Jon D. Vrana, Natural Resources Conservation Service; Thomas N. Schmitt, Harold Owen, and Walter T. Schaefer, North Carolina Department of Environment, Health, and Natural Resources; and Sara A. Browning, U.S. Forest Service.

United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with
United States Department of Agriculture, Forest Service; North Carolina Department of Environment, Health, and Natural Resources; North Carolina Agricultural Research Service; North Carolina Cooperative Extension Service; Macon Soil and Water Conservation District; and Macon County Board of Commissioners

MACON COUNTY is in the southwestern part of North Carolina (fig. 1). It has a total area of 332,467 acres. In 1990, it had a population of 23,499. Franklin, the county seat, had a population of 2,873 *(13)*.

Macon County is in the Mountain physiographic region. It is bordered in North Carolina on the north by Graham and Swain Counties, on the east by Jackson County, and on the west by Clay and Cherokee Counties. It is bordered on the south by Rabun County, Georgia. Elevation ranges from 1,840 feet above sea level, where the Little Tennessee River flows into Swain County, to 5,500 feet at the top of Standing Indian Mountain.

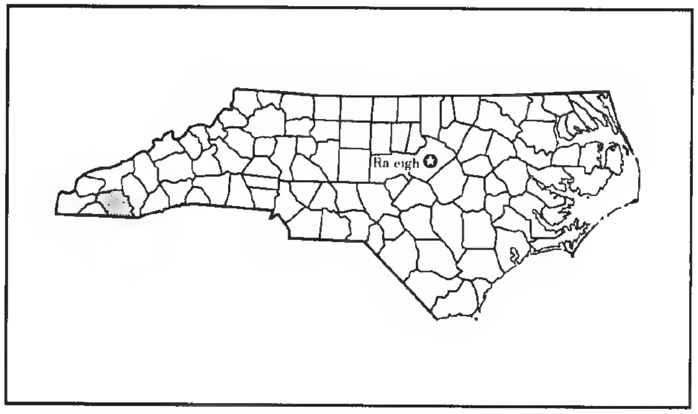

Figure 1.—Location of Macon County in North Carolina.

General Nature of the County

This section provides general information concerning Macon County. It describes history and settlement; economic development; water resources; physiography, relief, and drainage; and climate.

History and Settlement

The Cherokee Indian Nation occupied the area that is now Macon County when the first settlers moved into the area. Several Cherokee towns were located in the Little Tennessee River valley, including Nikwasi, which was on the site that is now occupied by the town of Franklin. The land was ceded by the Cherokee in 1819. The county was formed from Haywood County in 1828.

Settlers entering the area after the Cherokee ceded the land were largely of Scottish, Scotch-Irish, and English descent. A minority were of German, French, or African descent. These settlers had lived in other parts of North Carolina, South Carolina, or Virginia. They

moved to the area looking for land and opportunity *(9)*.

Following a decline after World War II, the population of Macon County has grown since about 1965. Several factors contributed to the growth. Better economic opportunity reduced out-migration, many people retired to the county, and many people began living part time in the county. The proportion of older people to younger has greatly shifted to more older people since 1965.

The current inhabitants can be divided into three general groups. The first group consists of the people who are largely descendants of the original settlers. The second group consists of people who moved to Macon County after about 1965. They were largely from northern states. They came to Macon County for retirement or to start and run businesses that service the retirement community or that are related to tourism. Most of the second group had previously moved to Florida before coming to Macon County. The third group consists of people who live in Florida in the winter and early spring and return to Macon County from late spring to fall.

Economic Development

Initially, Macon County was largely agricultural and self-sufficient. In the 1880's, railroads opened the area to large-scale mining and timber operations. By the 1950's, the timber resources had been largely exhausted. Most of the minerals mined in the county could be mined cheaper elsewhere or were replaced with synthetic substitutes. The need for the railroads declined, and most of the tracks were removed. Currently, only a few miles of tracks remain in the Nantahala Gorge. Tourism and services now dominate the economy. Highways have replaced the railroads in the new economy.

Agriculture is important in the county. The agricultural operations have changed from self-sufficient farms. Generally, the farms are now specialized, small, and grow a high-value crop. Large areas of the Scaly Mountain community are used for cabbage production. Other areas of the mountains are used to grow Christmas trees. Flood plains and coves are used to grow landscaping plants, tobacco, tomatoes, and strawberries.

The timber industry is important in the county. About 150,000 acres of U.S. Forest Service lands are in the county. Much of this acreage is used for timber production. It produces a reliable supply of quality hardwoods.

Tourism is a major industry in the county, which has many scenic views, clear streams, a very pleasant climate in summer, and spectacular colors in fall. People visiting the area can play golf, fish, hike, raft, camp, or sightsee. The U.S. Forest Service lands provide a base for much of the recreation.

Because a large part of the population is retired, the county supports many service jobs in real estate, construction, health care, retail sales, and recreation.

Water Resources

Macon County has an abundant supply of water from rivers, streams, and ground water sources. High-quality water that flows from the watersheds managed by the U.S. Forest Service is important to tourism in the county. Streams that flow from watersheds that have many roads, homes, or farms generally have lower quality water. Sediment is the main problem. Stream quality can be improved by soil and water conservation practices. Drilled wells are the most common source of domestic water. Some springs are used. The water for the town of Franklin is from Cartoogechaye Creek.

Physiography, Relief, and Drainage

Macon County is in the mountains of southwestern North Carolina. The terrain varies from nearly level flood plains to almost vertical rock cliffs. Elevations range from 1,840 feet above sea level, where the Little Tennessee River flows into Swain County, to 5,500 feet at the top of Standing Indian Mountain. The physiography of the county consists of high, intermediate, and low mountains; low rolling hills; flood plains; and low stream terraces.

The high mountain landscape is above 4,800 feet in elevation. It is confined to the tops of a few mountains, such as Standing Indian Mountain and Wayah Bald. This landscape is exposed to cold temperatures and high winds. It has very deep to shallow, well drained, strongly sloping to very steep soils. These soils have a topsoil that is very rich in organic matter.

The intermediate mountain landscape ranges from 3,500 to 4,800 feet in elevation. It is the most extensive landscape in the county. The intermediate mountains have very deep to shallow, well drained to excessively drained, gently sloping to very steep soils on side slopes and ridges. Very deep, well drained or moderately well drained, gently sloping to very steep soils are in coves and drainageways. The soils on cool aspects and in coves and drainageways have a topsoil that is rich in organic matter.

The low mountain landscape ranges from 2,500 to 3,500 feet in elevation. It has very deep to moderately deep, well drained, gently sloping to very steep soils on side slopes and ridges. Very deep, well drained, gently sloping to steep soils are in coves and drainageways. The soils in coves and drainageways have a topsoil that is rich in organic matter.

The low rolling hills range from 2,000 to 2,500 feet in elevation. The larger areas occur in a few pockets along streams, such as the Little Tennessee River, Cartoogechaye Creek, and Iotla Creek. The low rolling hills have very deep, well drained, slightly eroded to moderately eroded, gently sloping to moderately steep soils on side slopes and ridges. Very deep, well drained, gently sloping to strongly sloping soils are in coves and drainageways. The soils in coves and drainageways have a topsoil that is rich in organic matter.

The flood plains and low stream terraces range from 1,840 to 2,500 feet in elevation. They are along streams, such as the Little Tennessee River, the Cullasaja River, Cartoogechaye Creek, and Iotla Creek. They have very deep, well drained to very poorly drained, nearly level or gently sloping soils. These soils have a topsoil that is rich in organic matter.

Relief varies from one landscape to another. The mountain landscapes are dominated by strong relief and slopes ranging from moderately steep to very steep. The low rolling hills have moderate relief and slopes ranging from gently sloping to moderately steep. The flood plains and low stream terraces have low relief and are nearly level or gently sloping.

The county is largely in the Little Tennessee River watershed. A small part of the county south of the town of Highlands, however, is in the Chattooga River watershed. The Nantahala River, which is part of the Little Tennessee River system, drains the western part of the county. The headwaters of the Little Tennessee River are in Georgia. Some of the larger streams joining the river are the Cullasaja River and Middle, Tessentee, Cartoogechaye, Cowee, Coweeta, and Burningtown Creeks.

Climate

The climate in Macon County varies greatly from the high mountains to the low rolling hills and flood plains of the valleys. The climate at any single place in the county is influenced by elevation and aspect. Moisture laden winds from the Gulf of Mexico enter the county from the south. Annual rainfall varies significantly. It averages about 52 inches near the town of Franklin. It increases to the south of Franklin and at the higher elevations. At the town of Highlands, it is about 85 inches. Similar variations occur in temperature, snowfall, freeze dates, and length of the growing season. The data in Tables 1, 2, and 3 reflect the climate of the valleys in the central part of the county and do not necessarily apply to other parts of the county.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Franklin, North Carolina, in the period 1951 to 1981. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 39 degrees F and the average daily minimum temperature is 26 degrees F. The lowest temperature on record, which occurred at Franklin on January 30, 1966, is -10 degrees F. In summer, the average temperature is 72 degrees F and the average daily maximum temperature is 85 degrees F. The highest recorded temperature, which occurred at Franklin on July 29, 1952, is 101 degrees F.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 52 inches. Of this, 26 inches, or 50 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 22 inches. The heaviest 1-day rainfall during the period of record was 5.84 inches at Franklin on October 3, 1964. Thunderstorms occur on about 46 days each year.

The average seasonal snowfall is about 8 inches. The greatest snow depth at any one time during the period of record was 11 inches. On an average of 3 days, at least 1 inch of snow is on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 90 percent. The sun shines 60 percent of the time possible in summer and 55 percent in winter. The prevailing wind is from the north. Average windspeed is highest, 10 miles per hour, in winter.

How This Survey Was Made

This survey was made to provide information about the soils in Macon County. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the

kinds of bedrock. They studied many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. It extends from the surface down into the material from which the soil formed.

Soils occur in an orderly pattern that results from the combined influence over time of climate, parent material, relief, and plants and animals. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils and relating their position to specific segments of the landscape, soil scientists develop a concept, or model, of how the soils were formed. This model enables the soil scientists to predict with a considerable degree of accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify the soils. After describing the soils and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area are generally collected for laboratory analyses and for engineering tests. The data from these analyses and tests and from field-observed characteristics and soil properties are used to predict behavior of the soils under different uses. Interpretations are field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a relatively high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will be at a specific level in the soil on a specific date.

Soil boundaries are drawn on aerial photographs and each delineation is identified as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in accurately locating boundaries.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by two or three kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. In the detailed soil map units, these latter soils are called inclusions or included soils. In the general soil map units, they are called minor soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are identified in the map unit

descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soils on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or a building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

Loamy Soils That Formed in Alluvium; on Flood Plains

1. Rosman-Reddies-Toxaway

Nearly level, well drained to very poorly drained soils that are very deep to moderately deep to strata of sand, gravel, and cobbles

The landscape of this map unit consists of flood plains along rivers and major creeks (fig. 2). Slopes range from 0 to 5 percent.

This map unit makes up about 3 percent of the county. It is about 25 percent Rosman soils, 17 percent Reddies soils, 10 percent Toxaway soils, and 48 percent soils of minor extent. The minor soils include Arkaqua, Biltmore, Dellwood, and Nikwasi soils on flood plains and Dillard, Hemphill, and Statler soils on stream terraces.

Rosman soils are deep or very deep to strata of sand, gravel, and cobbles. These well drained soils are on flood plains along large streams. They are frequently flooded. Typically, the surface layer is dark brown fine sandy loam. The subsoil is strong brown loam. The underlying material is strong brown fine sandy loam.

Reddies soils are moderately deep to sand, gravel, and cobbles. These moderately well drained soils are on flood plains along the smaller streams. They are frequently flooded. Typically, the surface layer is dark brown fine sandy loam. The subsoil is dark yellowish brown and yellowish brown fine sandy loam. The underlying material is mottled loamy sand and multicolored very cobbly sand.

Toxaway soils are very deep. These poorly drained and very poorly drained soils are on the lowest, wettest parts of flood plains along the major streams. They are frequently flooded. Typically, the surface layer is dark brown loam in the upper part and black loam in the lower part. The underlying material is dark gray loam and light brownish gray silty clay loam.

Most areas of this unit have been cleared of trees and are used for pasture or crops (fig. 3). Some areas, especially along the Little Tennessee River from Franklin south to the Georgia State line, are used for recreational purposes, woodland, or urban development.

Rosman soils are used intensively for crops, such as silage corn, tomatoes, cabbage, strawberries, landscaping plants, and hay. Drained areas of Toxaway soils commonly are used for silage corn, hay, or pasture. Reddies soils are used mainly for pasture or hay.

Some areas of this unit are used for camp sites or parks. Camp sites in this unit are preferred over those in units that are not so near to streams. This unit is suitable for such uses as ball fields and tennis courts because of its nearly level topography.

Most undrained areas of the Toxaway soils and the minor wet soils are wooded, but these areas generally are not managed for timber production. Yellow-poplar, American sycamore, eastern white pine, sweet birch, and eastern hemlock are the most common trees.

Some areas of this unit, particularly from Franklin south along the Little Tennessee River, are used for urban development. Commercial building sites on flood plains have been filled. The fill material is needed to

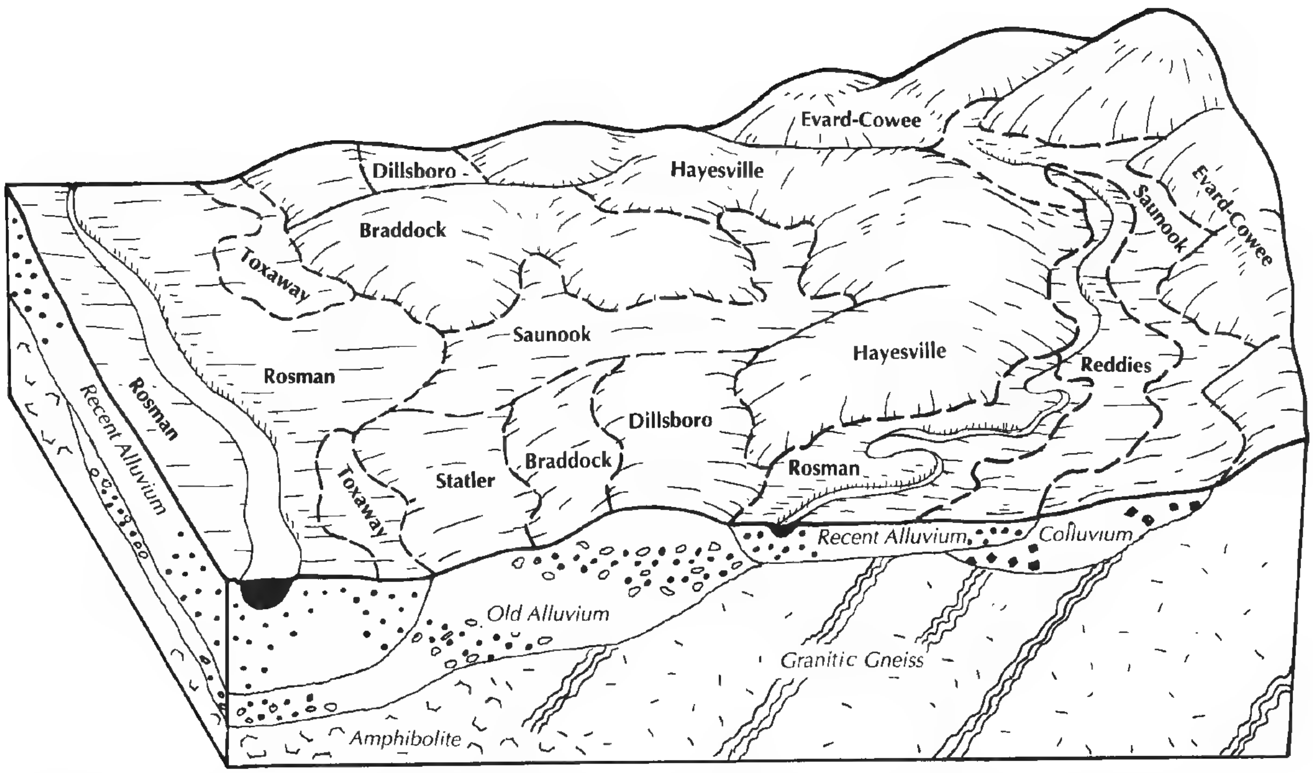

Figure 2.—Typical relationship of soils, landscape position, and parent material in the Rosman-Reddies-Toxaway and Hayesville-Braddock general soil map units.

prevent flooding. This unit is favored for urban development because it is near main roads, population centers, and shopping areas.

The frequent flooding is a major problem in areas of the Reddies, Rosman, and Toxaway soils. Also, wetness is a severe limitation in areas of the Toxaway soils.

Predominantly Clayey Soils That Formed in Material Weathered from High-Grade Metamorphic Rocks or in Old Alluvium; on Low, Rolling Hills

2. Hayesville-Braddock

Gently sloping to moderately steep, very deep, well drained soils; on uplands and high stream terraces

The landscape of this map unit consists of hilly uplands and high stream terraces that have broad ridgetops, short side slopes, toe slopes, drainageways, and coves (fig. 2). Slopes range from 2 to 30 percent. The drainageways join to become small branches, which in turn join creeks and rivers.

This map unit makes up about 3 percent of the county. It is about 46 percent Hayesville soils, 18 percent Braddock soils, and 36 percent soils of minor extent. The minor soils include Saunook soils in coves, on toe slopes, and along drainageways; Dillsboro soils on high stream terraces; Cowee and Evard soils on low mountains; and Nikwasi and Reddies soils on flood plains.

Hayesville soils are on ridgetops and side slopes in the uplands. Typically, the surface layer is reddish brown clay loam. The subsoil is red clay, clay loam, and loam. The underlying material is multicolored saprolite that has a texture of loam.

Braddock soils are on ridgetops and side slopes on high stream terraces. Typically, the surface layer is reddish brown clay loam. The subsoil is red clay and clay loam. The underlying material is multicolored loam.

Most areas of this unit have been cleared of trees and are used for hay or pasture. Some areas are used for row crops, specialty crops, landscaping plants, or woodland. Much of this unit is used for urban development in and around Franklin.

Hayesville soils commonly are used for pasture, hay, or apples. Braddock soils commonly are used for hay, silage corn, specialty crops, or landscaping plants.

Some areas on side slopes are wooded, but these areas generally are not managed for timber production. Scarlet oak, chestnut oak, hickory, pitch pine, and white oak are the most common trees.

Large areas of the unit are used for urban development. This unit is favored for homesites and commercial building sites because it is near major roads, schools, and shopping areas. Building and maintaining access roads generally are less difficult and expensive in areas of this unit than in areas of the other units in the county.

The slope and the hazard of erosion are the main management concerns. A high content of clay in the subsoil of the Braddock and Hayesville soils is an additional concern affecting some uses.

Figure 3.—No-till corn in an area of Rosman-Reddies-Toxaway general soil map unit. The background is an area of the Evard-Cowee-Saunook general soil map unit.

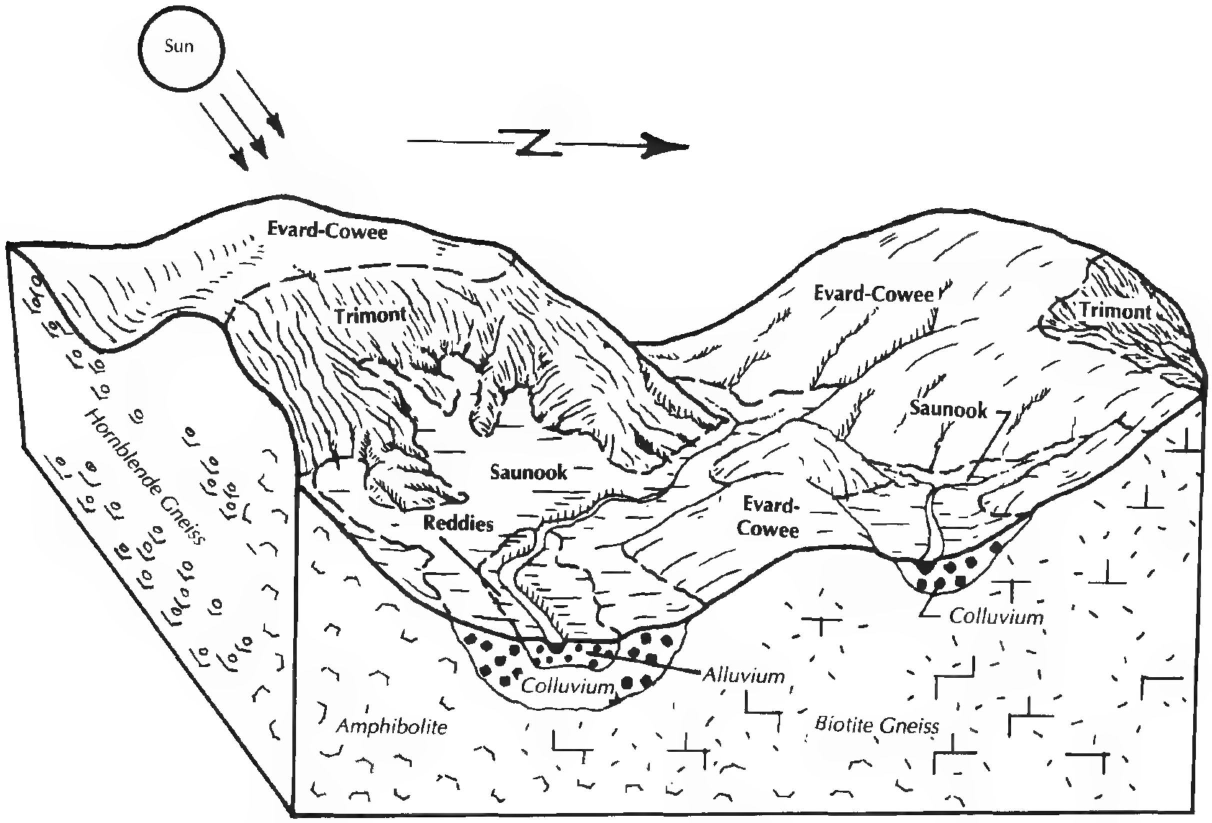

Figure 4.—Typical relationship of soils, landscape position, and parent material in the Evard-Cowee-Saunook general soil map unit.

Loamy Soils That Formed in Material Weathered from High-Grade Metamorphic Rocks or in Colluvium; Predominantly in Low Mountains

3. Evard-Cowee-Saunook

Strongly sloping to very steep, very deep to moderately deep, well drained soils; on uplands

The landscape of this map unit dominantly consists of moderately rugged, dissected low mountains that have long side slopes and narrow, winding ridgetops and drainageways (fig. 4). Some areas, however, are less sloping and have short side slopes and moderately broad ridgetops and drainageways. Slopes range from 8 to 95 percent. Numerous drainageways join to become creeks, which in turn join rivers. Streams flow in winding courses through bowl- and finger-shaped coves, narrow and moderately wide flood plains, and a few gorges that have small areas of rock outcrop.

This map unit makes up about 38 percent of the county. It is about 41 percent Evard soils, 18 percent Cowee soils, 11 percent Saunook soils, and 30 percent soils of minor extent and rock outcrop. The minor soils include Trimont soils on north- to east-facing side slopes; Dellwood, Nikwasi, and Reddies soils on flood plains; Cullasaja and Tuckasegee soils in coves; Chestnut and Edneyville soils on intermediate mountains; and Fannin soils on low mountains.

The strongly sloping to very steep, very deep Evard soils commonly are on south- to west-facing mountain ridgetops and side slopes. Typically, the surface layer is brown fine sandy loam. The subsoil is yellowish red or red sandy clay loam. The underlying material is multicolored saprolite that has a texture of sandy loam.

The strongly sloping to very steep, moderately deep Cowee soils commonly are on south- to west-facing mountain ridgetops and side slopes. Typically, the surface layer is brown sandy loam. The subsoil is red clay loam. The underlying material is multicolored saprolite that has a texture of sandy loam. Weathered, fractured gneiss bedrock is at a depth of about 38 inches.

The strongly sloping and moderately steep, very deep Saunook soils are in coves, on toe slopes, and in

drainageways. Typically, the surface layer is dark brown gravelly loam. The subsoil is strong brown clay loam and dark yellowish brown cobbly fine sandy loam. The underlying material is dark yellowish brown colluvium that has a texture of very cobbly fine sandy loam.

Most areas of this unit are used for timber production. Large areas of the unit are in the Nantahala National Forest. These areas are used not only for timber but also for public recreational activities, such as hiking, camping, fishing, hunting, and sightseeing.

Mountain ridgetops and south- to west-facing slopes are dominated by scarlet oak, chestnut oak, hickory, pitch pine, and white oak. North- to east-facing slopes are dominated by yellow-poplar, northern red oak, black cherry, sweet birch, and white oak. Coves, toe slopes, and drainageways are dominated by yellow-poplar. Productivity is affected by variations in rainfall. Soils in coves, on toe slopes, in drainageways, and on north- to east-facing side slopes are preferred for timber production. In areas that have steep and very steep slopes, logging is difficult and building access roads is difficult and expensive.

The less sloping areas outside the Nantahala National Forest commonly have been cleared of trees and are used for pasture, hay, or crops. These areas consist of the gently sloping to moderately steep Evard and Cowee soils on moderately broad ridgetops and the strongly sloping and moderately steep Saunook soils in coves and on toe slopes. The Evard and Cowee soils commonly are used for pasture, hay, or apples. The Saunook soils commonly are used for hay, silage corn, tomatoes, sweet corn, Christmas trees, or strawberries.

The well drained minor soils on flood plains, in coves, and on toe slopes are used for high-value crops, such as tomatoes, strawberries, and landscaping plants.

Privately owned areas commonly are used as homesites. Building access roads is difficult and expensive in the steep and very steep areas.

The slope is the main limitation affecting use and management. The hazard of erosion is a major management concern affecting uses that disturb the soils. The moderate depth to bedrock is an additional limitation in areas of the Cowee soils.

4. Fannin-Chandler

Strongly sloping to very steep, very deep, well drained and somewhat excessively drained soils that have a high content of mica; on uplands

The landscape of this map unit dominantly consists of moderately rugged, dissected low mountains that have long side slopes and narrow, winding ridgetops and drainageways. Some areas, however, have short side slopes and moderately broad ridgetops and drainageways. Slopes range from 8 to 95 percent. Numerous drainageways join to become creeks, which in turn join rivers. Streams flow through bowl- and finger-shaped coves, narrow and moderately wide flood plains, and a few gorges that have small areas of rock outcrop.

This map unit makes up about 7 percent of the county. It is about 30 percent Fannin soils, 29 percent Chandler soils, and 41 percent soils of minor extent and rock outcrop. The minor soils include Cashiers soils on north- to east-facing side slopes; Dellwood, Nikwasi, and Reddies soils on flood plains; Cullasaja, Saunook, Sylva, Tuckasegee, and Whiteside soils in coves; and Chestnut and Edneyville soils on intermediate mountains.

The strongly sloping to very steep Fannin soils commonly are on south- to west-facing mountain ridgetops and side slopes. Typically, the surface layer is brown fine sandy loam. The subsoil is predominantly red sandy clay loam and fine sandy loam. The underlying material is multicolored saprolite that has a texture of sandy loam.

The moderately steep to very steep Chandler soils commonly are on south- to west-facing mountain ridgetops and side slopes. Typically, the surface layer is dark brown gravelly fine sandy loam. The subsoil is yellowish brown loam or brownish yellow sandy loam. The underlying material is multicolored saprolite that has a texture of sandy loam.

Most areas of this unit are used for timber production. Large areas of the unit are in the Nantahala National Forest. These areas are used not only for timber but also for public recreational activities, such as hiking, camping, fishing, hunting, and sightseeing.

The areas of high rainfall in this unit are dominated by eastern white pine, yellow-poplar, white oak, and red maple. The areas of lower rainfall, mountain ridgetops, and south- to west-facing slopes are dominated by scarlet oak, chestnut oak, hickory, pitch pine, and white oak. North- to east-facing slopes are dominated by yellow-poplar, northern red oak, black cherry, sweet birch, and white oak. Coves, toe slopes, and drainageways are dominated by yellow-poplar. Productivity is better in the areas of higher rainfall. The coves, the toe slopes, the drainageways, and the north- to east-facing slopes are preferred for timber production. In the areas that have steep and very steep slopes, logging is difficult and building and maintaining access roads are difficult and expensive.

The less sloping areas outside the Nantahala National Forest commonly have been cleared of trees and are used for crops or pasture. These areas are very small and generally have high rainfall. Common crops include hay, Christmas trees, and landscaping

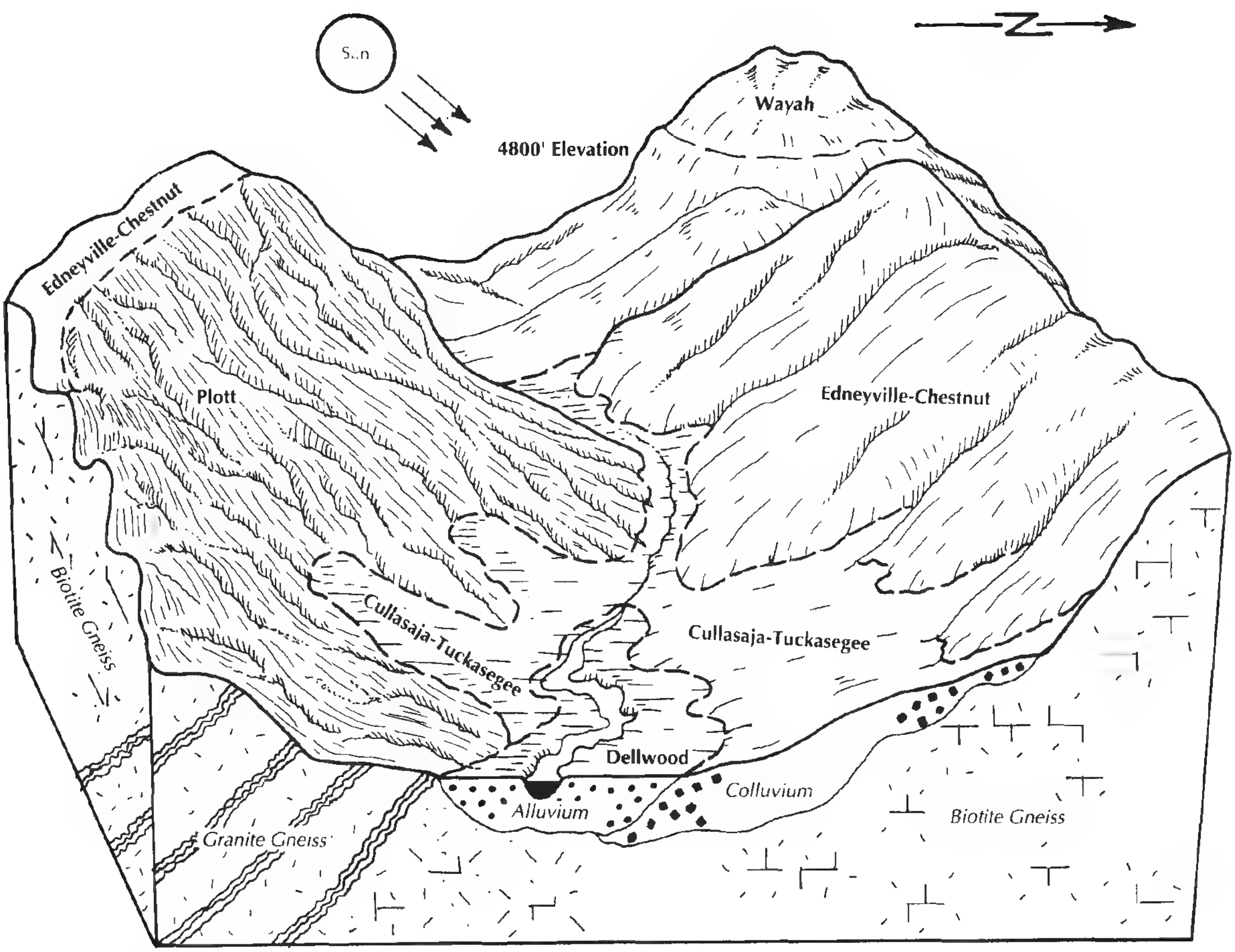

Figure 5.—Typical relationship of soils, landscape position, and parent material in the Edneyville-Plott-Chestnut-Cullasaja general soil map unit on intermediate mountains and the Wayah-Burton-Craggey general soil map unit on high mountains.

plants. Unvegetated areas are extremely erodible.

The well drained minor soils on flood plains, on toe slopes, and in coves are used for high-value crops, such as cabbage and landscaping plants.

Privately owned areas commonly are used as homesites. Building and maintaining access roads are difficult and expensive in the steep and very steep areas. Unvegetated areas are extremely erodible.

The slope is the main limitation affecting use and management. Micaceous saprolite underlies the Fannin and Chandler soils. Compacting this material for use in roadbeds is very difficult. Also, the saprolite is extremely erodible. The hazard of erosion is a major management concern affecting uses that disturb the soils.

Rock Outcrop and Loamy Soils That Formed in Material Weathered From High-Grade Metamorphic or Igneous Rocks or in Colluvium; Predominantly in Intermediate Mountains

5. Edneyville-Plott-Chestnut-Cullasaja

Strongly sloping to very steep, very deep to moderately deep, well drained soils; on uplands

The landscape of this map unit consists of rugged, dissected intermediate mountains that have long side slopes and narrow, winding ridgetops and drainageways (fig. 5). Slopes range from 8 to 95 percent. The numerous drainageways join to become creeks and rivers. Streams flow in winding courses through bowl-

and finger-shaped coves, along toe slopes, through narrow flood plains, and through gorges that have small areas of rock outcrop.

This map unit makes up about 28 percent of the county. It is about 26 percent Edneyville soils, 20 percent Plott soils, 16 percent Chestnut soils, 10 percent Cullasaja soils, and 28 percent soils of minor extent. The minor soils include Tuckasegee, Whiteside, and Sylva soils in coves and along toe slopes; Cowee and Evard soils on low mountains; Chandler soils on low and intermediate mountains; Cleveland soils around small areas of rock outcrop; and Dellwood soils on flood plains.

The strongly sloping to very steep, very deep Edneyville soils commonly are on south- to west-facing mountain ridgetops and side slopes. Typically, the surface layer is dark yellowish brown fine sandy loam. The subsoil is predominantly strong brown loam and fine sandy loam. The underlying material is multicolored saprolite that has a texture of sandy loam.

The steep and very steep, very deep Plott soils commonly are on north- to east-facing mountain side slopes. They also are on strongly sloping and moderately steep ridgetops on the higher parts of the intermediate mountains. Typically, the surface layer is very dark brown and very dark grayish brown fine sandy loam. The subsoil is dark yellowish brown fine sandy loam and gravelly fine sandy loam.

The strongly sloping to very steep, moderately deep Chestnut soils commonly are on south- to west-facing mountain ridgetops and side slopes. Typically, the surface layer is dark brown and dark yellowish brown gravelly fine sandy loam. The subsoil is dark yellowish brown gravelly fine sandy loam. The upper part of the underlying material is multicolored saprolite that has a texture of cobbly fine sandy loam. The lower part is multicolored, weathered, fractured gneiss.

The strongly sloping to very steep, very deep Cullasaja soils are in coves, on toe slopes, and in drainageways. Typically, the surface layer is very dark grayish brown cobbly sandy clay loam and dark brown cobbly fine sandy loam. The subsoil is strong brown cobbly sandy loam in the upper part and strong brown cobbly loamy sand in the lower part. The subsoil averages more than 35 percent rock fragments, by volume.

Most areas of the unit are used for timber production. Large areas of the unit are in the Nantahala National Forest. These areas are used not only for timber but also for public recreational activities, such as hiking, camping, fishing, hunting, and sightseeing.

The natural vegetation is mostly hardwoods, but eastern white pine and eastern hemlock are dominant in a few places. Mountain ridgetops and south- to west-facing slopes are dominated by scarlet oak, chestnut oak, hickory, pitch pine, and eastern white pine. North- to east-facing slopes are dominated by northern red oak, black cherry, sweet birch, sugar maple, and yellow-poplar. Coves, toe slopes, and drainageways are dominated by yellow-poplar. Productivity is better in the areas of higher rainfall. The coves, the toe slopes, the drainageways, and the north- to east-facing slopes are preferred for timber production. Logging is difficult in the areas that have very steep slopes. Building access roads is difficult and expensive in the areas that have steep and very steep slopes. Because the soil material and saprolite in this unit pack well, this is the best suited unit in the county for year-round logging.

The less sloping areas outside the Nantahala National Forest commonly have been cleared of trees and are used for pasture or landscaping plants. These areas consist of the strongly sloping and moderately steep Edneyville and Chestnut soils on moderately broad mountain ridgetops and side slopes and the strongly sloping and moderately steep Cullasaja soils and minor colluvial soils in coves and on toe slopes.

Privately owned areas commonly are used as sites for vacation homes. Many of the less sloping areas around the town of Highlands are used for golf courses. Building access roads is difficult and expensive in the steep and very steep areas.

The slope is the main limitation affecting use and management. The hazard of erosion is a major management concern affecting uses that disturb the soils. The moderate depth to bedrock in the Chestnut soils and the content of rock fragments in the subsoil of the Cullasaja soils are severe limitations affecting many uses.

6. Edneyville-Tuckasegee-Chestnut

Gently sloping to moderately steep, very deep to moderately deep, well drained soils; on uplands

The landscape of this map unit consists of moderately broad ridgetops and short side slopes in intermediate mountains and large coves. Slopes range from 2 to 30 percent. The drainageways join to become small branches, which in turn join creeks and rivers.

This map unit makes up about 1 percent of the county. It is about 33 percent Edneyville soils, 14 percent Tuckasegee soils, 13 percent Chestnut soils, and 40 percent soils of minor extent. The minor soils include Nikwasi and Reddies soils on flood plains, Sylva and Whiteside soils in coves and on toe slopes,

Chandler soils on mountains, and Cleveland soils around small areas of rock outcrop on mountains.

The gently sloping to moderately steep, very deep Edneyville soils are on mountain ridgetops and short side slopes. Typically, the surface layer is dark yellowish brown fine sandy loam. The subsoil is predominantly strong brown loam and fine sandy loam. The underlying material is multicolored saprolite that has a texture of sandy loam.

The gently sloping to moderately steep, very deep Tuckasegee soils are in coves, on toe slopes, and in drainageways. Typically, the surface layer is black and dark brown fine sandy loam. The subsoil is dark brown fine sandy loam in the upper part, brown sandy clay loam in the next part, and strong brown cobbly sandy clay loam in the lower part.

The gently sloping to moderately steep, moderately deep Chestnut soils are on mountain ridgetops and side slopes. Typically, the surface layer is dark brown and dark yellowish brown gravelly fine sandy loam. The subsoil is dark yellowish brown gravelly fine sandy loam. The upper part of the underlying material is multicolored saprolite that has a texture of cobbly fine sandy loam. The lower part is multicolored, weathered, fractured gneiss.

Most areas of this unit have been cleared of trees. Many areas are used as sites for vacation homes, as sites for golf courses and associated developments near the town of Highlands, and for cabbage and Christmas trees near Scaly Mountain. Some areas of the unit support scarlet oak, chestnut oak, hickory, eastern white pine, and white oak, but the unit is not commonly managed for timber production.

The slope is the main limitation affecting use and management. The hazard of erosion is a major management concern affecting uses that disturb the soils. Management practices that control runoff and minimize erosion are particularly important where cabbage is grown. The moderate depth to bedrock in the Chestnut soils is an additional management concern affecting some uses.

7. Cleveland-Rock Outcrop-Chestnut

Rock outcrop and moderately steep to very steep, moderately deep and shallow, well drained and somewhat excessively drained soils; on uplands

The landscape of this map unit consists of rugged mountains that have rounded tops and long side slopes with rock cliffs. Most areas have moderately broad ridgetops and nearly vertical rock faces. Some of the long side slopes have small, scattered areas of Rock outcrop. Slopes range from 15 to 95 percent.

This map unit makes up about 4 percent of the county. It is about 38 percent Cleveland soils, 30 percent Rock outcrop, 17 percent Chestnut soils, and 15 percent soils of minor extent. The minor soils include Cullasaja soils in drainageways and Burton and Craggey soils on high mountains.

The moderately steep to very steep, shallow Cleveland soils are on ridgetops and side slopes. Typically, the surface layer is black sandy loam. The subsoil is dark yellowish brown and yellowish brown loam. Hard, fractured granite is at a depth of 17 inches.

The areas of Rock outcrop generally are nearly vertical but range to moderately steep.

The moderately steep to very steep, moderately deep Chestnut soils are on ridgetops and side slopes. Typically, the surface layer is dark brown and dark yellowish brown gravelly fine sandy loam. The subsoil is dark yellowish brown gravelly fine sandy loam. The upper part of the underlying material is multicolored saprolite that has a texture of cobbly fine sandy loam. The lower part is multicolored, weathered, fractured gneiss.

Most areas of this unit are wooded and are in the Nantahala National Forest. These areas are not managed for timber production, however, because the trees are severely stunted by wind and ice. These areas are used for public recreational activities, such as hiking, camping, hunting, and sightseeing.

Ridgetops and south- to west-facing slopes are dominated by scarlet oak, chestnut oak, hickory, pitch pine, and eastern white pine. North- to east-facing slopes are dominated by northern red oak, black cherry, sweet birch, sugar maple, and eastern white pine.

Privately owned areas commonly are used as sites for vacation homes because of the scenic views. Building and maintaining access roads are extremely difficult and expensive.

The main limitations are the slope, the shallowness to bedrock, stones, the numerous areas of Rock outcrop, and the hazard of erosion in areas where the soil is disturbed. The growing conditions for trees are very poor.

Loamy Soils That Formed in Material Weathered from High-Grade Metamorphic or Igneous Rocks; in High Mountains

8. Wayah-Burton-Craggey

Strongly sloping to very steep, very deep to shallow, well drained and somewhat excessively drained soils

The landscape of this map unit consists of rugged, dissected mountain peaks and the upper parts of side

slopes at elevations of more than 4,800 feet (fig. 5). The peaks of these high mountains are rounded and generally are moderately broad. Slopes range from 8 to 95 percent.

This map unit makes up about 1 percent of the county. It is about 56 percent Wayah soils, 14 percent Burton soils, 10 percent Craggey soils, and 20 percent soils of minor extent and rock outcrop. The minor soils include Oconaluftee soils on high mountains that have metasedimentary rock and Cullasaja soils in drainageways on intermediate mountains.

The very deep Wayah soils are strongly sloping to very steep. Typically, the surface layer is very dark brown sandy loam and very dark grayish brown fine sandy loam. The subsoil is dark brown, light olive brown, and yellowish brown sandy loam. The underlying material is multicolored saprolite that has a texture of loamy sand.

The moderately deep Burton soils are moderately steep to very steep. Typically, the surface layer is black and very dark brown loam. The subsoil is dark yellowish brown cobbly sandy loam. The underlying material is multicolored saprolite that has a texture of cobbly sandy loam. Hard, fractured gneiss is at a depth of 36 inches.

The shallow Craggey soils are moderately steep to very steep. Typically, the surface layer is black and very dark grayish brown cobbly sandy loam. The subsoil is dark yellowish brown cobbly sandy loam. Hard, fractured gneiss is at a depth of 17 inches.

Most areas of the unit are wooded and are in the Nantahala National Forest. These areas are not managed for timber production, however, because the trees are severely stunted by wind and ice. These areas are used for public recreational activities, such as hiking, camping, hunting, and sightseeing.

Northern red oak is the dominant tree. Other trees include yellow birch, black cherry, sweet birch, and sugar maple. The trees are stunted, twisted, and otherwise damaged by wind and ice.

The strongly sloping and moderately steep privately owned areas commonly have been cleared and are used for pasture or Christmas trees.

Some privately owned areas are used as sites for vacation homes. Building and maintaining access roads are difficult and expensive.

The main limitations are the slope, the shallow and moderate depth to bedrock in the Craggey and Burton soils, stones, the numerous areas of rock outcrop, and the hazard of erosion where the soil is disturbed. The growing conditions for trees are very poor.

Loamy Soils That Formed in Material Weathered from Metasedimentary Rocks; Predominantly in Low Mountains

9. Brasstown-Junaluska

Strongly sloping to very steep, deep and moderately deep, well drained soils; on uplands

The landscape of this map unit consists of moderately rugged, dissected low mountains that have long side slopes and narrow, winding ridgetops and drainageways. Slopes range from 8 to 95 percent. The numerous drainageways join to become creeks, which in turn join rivers. Streams flow in winding courses through bowl- and finger-shaped coves, narrow and moderately wide flood plains, and a few gorges that have small areas of rock outcrop.

This map unit makes up about 2 percent of the county. It is about 37 percent Brasstown soils, 30 percent Junaluska soils, and 33 percent soils of minor extent and rock outcrop. The minor soils include Spivey and Santeetlah soils in coves, on toe slopes, and in drainageways; Dellwood, Nikwasi, and Reddies soils on flood plains; and Soco and Stecoah soils on intermediate mountains.

The strongly sloping to very steep, deep Brasstown soils commonly are on south- to west-facing mountain ridgetops and side slopes. Typically, the surface layer is reddish brown loam. The subsoil is red clay loam and loam. The underlying material is multicolored, weathered, fractured metasandstone.

The strongly sloping to very steep, moderately deep Junaluska soils commonly are on south- to west-facing mountain ridgetops and side slopes. Typically, the surface layer is yellowish red channery fine sandy loam. The subsoil is red sandy clay loam. The upper part of the underlying material is multicolored saprolite that has a texture of flaggy fine sandy loam. The lower part is multicolored, weathered, fractured metasandstone.

Most areas of this unit are used for timber production. Large areas of the unit are in the Nantahala National Forest. These areas are used not only for timber but also for public recreational activities, such as hiking, camping, fishing, hunting, and sightseeing.

Most areas of this unit are dominated by scarlet oak, chestnut oak, hickory, pitch pine, and white oak. Coves, toe slopes, and drainageways are dominated by yellow-poplar and are preferred for timber production. In the areas that have steep and very steep slopes, logging is difficult and building and maintaining access roads are difficult and expensive. Areas where seams of ultra acid, sulfur-bearing rock are unearthed require special treatment.

The less sloping privately owned areas commonly

have been cleared of trees and are used for pasture or hay. These areas consist mainly of the strongly sloping and moderately steep Brasstown and Junaluska soils on moderately broad ridgetops. The well drained minor soils on flood plains, in coves, and on toe slopes commonly are used for burley tobacco, tomatoes, or cabbage.

Privately owned areas commonly are used as homesites. Building and maintaining access roads are difficult and expensive in the steep and very steep areas. Areas where seams of ultra acid, sulfur-bearing rock are unearthed require special treatment.

The slope is the main limitation affecting use and management. The hazard of erosion is a major management concern affecting uses that disturb the soils. Additional problems are the moderate depth to bedrock in the Junaluska soils and rock and earth slides and the exposure of ultra acid, sulfur-bearing rock where deep cuts are made.

Loamy Soils That Formed in Material Weathered from Metasedimentary Rocks or in Colluvium; in Low and Intermediate Mountains

10. Soco-Stecoah-Cheoah-Spivey

Strongly sloping to very steep, very deep to moderately deep, well drained soils; on uplands

The landscape of this map unit consists of rugged, dissected intermediate mountains that have long side slopes and very narrow, winding ridgetops and drainageways. Slopes range from 8 to 95 percent. The numerous drainageways join to become creeks, which in turn join rivers. Streams flow in winding courses through bowl- and finger-shaped coves, narrow flood plains, and gorges that have small areas of rock outcrop.

This map unit makes up about 10 percent of the county. It is about 23 percent Soco soils, 21 percent Stecoah soils, 18 percent Cheoah soils, 11 percent Spivey soils, and 27 percent soils of minor extent. The minor soils include Dellwood, Nikwasi, and Reddies soils on flood plains; Santeetlah soils in coves and on toe slopes; Cataska soils around small areas of rock outcrop; and Brasstown and Junaluska soils on south- to west-facing slopes.

The strongly sloping to very steep, moderately deep Soco soils commonly are on south- to west-facing mountain ridgetops and side slopes. Typically, the surface layer is dark yellowish brown channery fine sandy loam. The subsoil is strong brown channery fine sandy loam and flaggy fine sandy loam. The underlying material is multicolored, weathered, fractured, interbedded metasandstone and phyllite.

The strongly sloping to very steep, deep Stecoah soils commonly are on south- to west-facing mountain ridgetops and side slopes. Typically, the surface layer is dark yellowish brown channery fine sandy loam. The subsoil is strong brown channery fine sandy loam. The upper part of the underlying material is multicolored saprolite that has a texture of channery fine sandy loam. The lower part is multicolored, weathered, fractured, interbedded metasandstone and phyllite.

The steep and very steep, deep Cheoah soils commonly are on north- to east-facing mountain side slopes. Typically, the surface layer is very dark brown channery loam and dark brown channery fine sandy loam. The subsoil is yellowish brown fine sandy loam and channery fine sandy loam. The underlying material is multicolored, weathered, fractured, interbedded metasandstone and phyllite.

The strongly sloping to steep, very deep Spivey soils are in coves, on toe slopes, and in drainageways. Typically, the surface layer is very dark brown and dark brown very flaggy loam. The upper part of the subsoil is dark yellowish brown very flaggy fine sandy loam. The lower part is dark brown flaggy fine sandy loam.

Most areas of this unit are used for timber production. Large areas of the unit are in the Nantahala National Forest. These areas are used not only for timber but also for public recreational activities, such as hiking, camping, fishing, hunting, and sightseeing.

Ridgetops and south- to west-facing slopes are dominated by scarlet oak, chestnut oak, black oak, hickory, pitch pine, and Virginia pine. North- to east-facing slopes are dominated by northern red oak, black cherry, sweet birch, sugar maple, and yellow-poplar. Coves, toe slopes, and drainageways are dominated by yellow-poplar. Productivity generally is better in the areas of higher rainfall. The north- to east-facing slopes, the coves, the toe slopes, and the drainageways are preferred for timber production. Logging is difficult in the areas that have steep and very steep slopes. Building and maintaining access roads are difficult and expensive. Areas where seams of ultra acid, sulfur-bearing rock are unearthed require special treatment.

The less sloping privately owned areas commonly have been cleared of trees and are used for crops or pasture. These areas consist of the moderately steep Soco and Stecoah soils on ridgetops and the strongly sloping and moderately steep Santeetlah and Spivey soils in coves and on toe slopes. The Soco and Stecoah soils commonly are used for pasture or hay. The Spivey and Santeetlah soils commonly are used for landscaping plants.

The well drained minor soils on flood plains, in coves, and on toe slopes commonly are used for burley tobacco, tomatoes, or cabbage.

Privately owned areas commonly are used as homesites. Maintaining access roads is difficult and expensive. Areas where seams of ultra acid, sulfur-bearing rock are unearthed require special treatment.

The slope is the main limitation affecting use and management. The hazard of erosion is a major management concern affecting uses that disturb the soils. Additional problems are the moderate depth to bedrock in the Soco soils, the content of rock fragments in the Spivey soils, and rock and earth slides and the exposure of ultra acid, sulfur-bearing rock where deep cuts are made.

11. Cataska-Sylco-Cheoah-Spivey

Moderately steep to very steep, shallow to very deep, well drained to excessively drained soils; on uplands

The landscape of this map unit consists of rugged intermediate mountains that have very long side slopes and very narrow, winding ridgetops and drainageways. Slopes range from 15 to 95 percent. The drainageways join to become creeks, which flow in winding courses through small coves.

This map unit makes up about 3 percent of the county. It is about 24 percent Cataska soils, 20 percent Sylco soils, 15 percent Cheoah soils, 10 percent Spivey soils, and 31 percent soils of minor extent and rock outcrop. The minor soils include Santeetlah soils in drainageways and Junaluska, Stecoah, and Soco soils on foot slopes.

The steep and very steep, shallow Cataska soils are on mountain ridgetops and side slopes. Typically, the surface layer is dark brown very channery loam. The subsoil is dark yellowish brown very channery loam. The underlying material is weathered, multicolored slate bedrock. Below this is hard slate bedrock.

The steep and very steep, moderately deep Sylco soils are on mountain ridgetops and side slopes. Typically, the surface layer is dark brown very channery loam. The subsoil is dark yellowish brown very channery loam. The underlying material is weathered, multicolored slate bedrock. Below this is hard slate bedrock.

The steep and very steep, deep Cheoah soils commonly are on north- to east-facing mountain side slopes. Typically, the surface layer is very dark brown channery loam and dark brown channery fine sandy loam. The subsoil is yellowish brown fine sandy loam and channery fine sandy loam. The underlying material is multicolored, weathered, fractured, interbedded metasandstone and phyllite.

The moderately steep and steep, very deep Spivey soils are in small coves, on toe slopes, and in drainageways. Typically, the surface layer is very dark brown and dark brown very flaggy loam. The upper part of the subsoil is dark yellowish brown very flaggy fine sandy loam. The lower part is dark brown flaggy fine sandy loam.

Most areas of this unit are used for timber production. Large areas of the unit are in the Nantahala National Forest. These areas are used not only for timber but also for public recreational activities, such as hiking, camping, hunting, and sightseeing.

Ridgetops and south- to west-facing slopes are dominated by scarlet oak, chestnut oak, and hickory. Some areas, however, support pitch pine and Virginia pine. North- to east-facing slopes are dominated by northern red oak, black cherry, sweet birch, sugar maple, and eastern white pine. Coves, toe slopes, and drainageways are dominated by yellow-poplar. Productivity is better in the areas of higher rainfall. The north- to east-facing slopes, the coves, the toe slopes, and the drainageways are preferred for timber production. Logging is difficult in the areas that have steep and very steep slopes. Building and maintaining access roads are extremely difficult and expensive. Areas where seams of ultra acid, sulfur-bearing rock are unearthed require special treatment.

Privately owned areas commonly are used as sites for vacation homes because of the scenic views. Building and maintaining access roads are extremely difficult and expensive. Areas where seams of ultra acid, sulfur-bearing rock are unearthed require special treatment.

The slope is the main limitation affecting use and management. The hazard of erosion is a major management concern affecting uses that disturb the soils. Additional problems are the shallow to moderate depth to bedrock in the Cataska and Sylco soils; the content of rock fragments in the Cataska, Sylco, and Spivey soils; and rock and earth slides and the exposure of ultra acid, sulfur-bearing rock where deep cuts are made.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of the dominant soils within the map unit for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit is given under the heading "Use and Management of the Soils."

The map units on the detailed soil maps represent areas on the landscape and consist mainly of the dominant soils for which the units are named.

Symbols used to identify the map units on the detailed soils map precede the map unit names at the beginning of each soil description. The descriptions include general facts about the soils and give the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Plott fine sandy loam, 50 to 95 percent slopes, stony, is a phase of the Plott series.

Some map units are made up of two or more major soils. These map units are called soil complexes. A *soil complex* consists of two or more contrasting soils or miscellaneous land areas in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Edneyville-Chestnut complex, 50 to 95 percent slopes, stony, is an example.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas* as a component in some map units. Such areas have little or no soil material and support little or no vegetation. Miscellaneous areas are shown on the soil maps. Rock outcrop in the map unit, Rock outcrop-Cleveland complex, windswept, 30 to 95 percent slopes, is an example. Some miscellaneous areas that are too small to be shown are identified by a special symbol on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and suitabilities for many uses. The Glossary defines many of the terms used in describing the soils.

ArA—Arkaqua loam, 0 to 2 percent slopes, frequently flooded. This map unit consists mainly of nearly level, very deep, somewhat poorly drained Arkaqua and similar soils in depressions on flood plains along the major streams. Individual areas are long bands that parallel well drained soils along the streams. They range from 2 to 30 acres in size.

The typical sequence, depth, and composition of the layers of the Arkaqua soil are as follows—

Surface layer:

0 to 10 inches, dark brown loam

Subsoil:

10 to 22 inches, dark yellowish brown loam that has brownish yellow mottles

22 to 29 inches, mottled brownish yellow and gray loam

29 to 48 inches, gray clay loam

Underlying material:

48 to 60 inches, gray loam

Permeability is moderate. Surface runoff is slow. The soil is frequently flooded for very brief periods. The seasonal high water table is 1.5 to 2.0 feet below the surface. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is moderate or high.

Included in mapping are small areas of Dillard, Rosman, Statler, and Toxaway soils. Dillard and Statler soils are rarely flooded. They are on small, elevated knolls. Rosman and Statler soils are well drained, and Dillard soils are moderately well drained. Toxaway soils are poorly drained or very poorly drained. They are in depressions. Rosman soils are along stream channels. Contrasting inclusions make up about 20 percent of this map unit.

Much of the acreage in this map unit is used as pasture or hayland. Other uses include row crops, woodland, and recreational activities.

This map unit is only moderately suited to pasture and hay because of the wetness and the flooding. Soil compaction and damage to streambanks also are management concerns. Land shaping helps to open outlets and drain surface water from depressions. Tile drainage may be needed in wet areas. Grazing during wet periods causes compaction, increases the hazard of ponding, and reduces the rate of water infiltration. Properly locating watering facilities, stream crossings, and fences can help to prevent damage to streambanks and improve water quality.

This map unit is only moderately suited to row crops because of the wetness and the flooding. Crusting and runoff from the adjacent higher areas also are management concerns. Corn for silage is the most common crop. Properly designed plowing patterns are needed to keep drainage outlets open and to prevent the formation of depressions. Land shaping helps to open outlets and drain surface water from depressions. Drainage tile removes excess water. Grassed field borders and grassed waterways can safely divert runoff. Herbicides may be ineffective because of the high organic matter content. Frost damage to sensitive crops can be significant because of poor air drainage. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat.

This map unit is only moderately suited to woodland because of the wetness and the flooding. An equipment limitation is a moderate management concern. This soil is not used for timber production because of the small size of the areas and the higher profits from crops, pasture, and hayland. Yellow-poplar is the most common tree. Other trees include river birch, black cherry, and American sycamore.

This map unit is poorly suited to most recreational uses because of the wetness and the flooding. Because of the nearly level terrain and the proximity to streams, however, many areas are used for camp sites, parks, picnic areas, ball fields, or tennis courts.

This map unit is poorly suited to building site development because of the wetness and the flooding. It is rarely used for this purpose.

This map unit is poorly suited to access roads because of the flooding and low strength. Runoff from the adjacent higher areas also is a management concern. Elevating roads during construction minimizes the damage caused by flooding. The roads should be designed so that runoff is diverted. Wet areas should be drained. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality.

The capability subclass is IIIw in drained areas and IVw in undrained areas. Based on eastern white pine as the indicator species, the woodland ordination symbol is 12W.

BeA—Biltmore sandy loam, 0 to 3 percent slopes, frequently flooded. This map unit consists mainly of nearly level, very deep, well drained Biltmore and similar soils on flood plains. Individual areas are on the inside of the curve at the bends of major streams and in long bands beside stream channels. They range from 2 to 20 acres in size.

The typical sequence, depth, and composition of the layers of the Biltmore soil are as follows—

Surface layer:

0 to 12 inches, dark yellowish brown sandy loam

Underlying material:

12 to 60 inches, yellowish brown loamy fine sand

Permeability is rapid. Surface runoff is slow. The soil is frequently flooded for brief periods. The seasonal high water table is 3.5 to 6.0 feet below the surface. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is moderate or high.

Included in mapping are small areas of Reddies and Rosman soils. These soils have a loamy subsoil. Reddies soils are moderately deep to strata of gravel, cobbles, and sand. They are in areas scoured by floodwater along the main stream channel or in areas where smaller streams cross the unit. Rosman soils are away from the stream channel and are in slightly lower positions. Also included are small areas where flooding has removed all the soil material and has exposed a layer of stones, cobbles, gravel, and sand. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Biltmore soil but have a darker surface layer.

Much of the acreage in this map unit is used as pasture or hayland. Other uses include row crops, specialty crops, woodland, and recreational activities.

This map unit is only moderately suited to pasture and hay because of the flooding. Droughtiness and damage to streambanks also are management concerns. Tall fescue, ladino clover, and orchardgrass are commonly grown. Properly locating watering facilities, stream crossings, and fences can help to prevent damage to streambanks and improve water quality.

This map unit is only moderately suited to row crops because of the flooding. Droughtiness and frost are additional management concerns. Frost damage to sensitive crops can be significant because of poor air drainage. This soil is desirable for row crops because it has very good access, is near a source of irrigation water, is nearly level, and has good productivity if properly fertilized and irrigated. The most common crops are sweet corn, tomatoes, burley tobacco, and strawberries. Early planting allows some crops, such as tomatoes, to be harvested before crops grown farther north. Equipment can be used on this soil a few hours after a heavy rain. This good access allows for timely planting, managing, and harvesting. Irrigation is commonly used to protect high-value crops from frost and to supply supplemental water. Split applications of fertilizer are needed because nutrients are easily leached. Mulch is used in areas where strawberries are grown. It holds moisture, controls weeds, and keeps the berries clean. Land shaping helps to smooth the surface and improves the efficiency of irrigation. Grassed field borders and grassed waterways carry excess water safely away from crops. Herbicides may be ineffective because of a high content of organic matter. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat.

This map unit is only moderately suited to specialty crops because of the flooding. Droughtiness is an additional problem. This unit is desirable for seedling production because it has very good access, is near a source of irrigation water, is nearly level, and has good productivity if properly fertilized and irrigated. The most common seedlings are eastern hemlock, Norway spruce, mountain laurel, rhododendron, and Fraser fir. Seedlings are easily pulled out of the soil without damage to the roots because of the sandy texture of the soil. Irrigation is needed. Land shaping helps to smooth the surface and improves the efficiency of irrigation. Mulch holds moisture in the soil.

This map unit is well suited to woodland. Few areas are used for timber production, however, because of the small size of the areas and the higher profits from crops, pasture, and hayland. The most common trees are yellow-poplar, river birch, black cherry, black walnut, and American sycamore.

This unit is moderately suited or poorly suited to most recreational uses because of the frequent flooding. Because of the nearly level terrain and the proximity to streams, however, it is used for camp sites, parks, picnic areas, ball fields, or tennis courts.

This map unit is poorly suited to building site development because of the flooding. It is rarely used for this purpose.

This map unit is poorly suited to access roads because of the flooding. It is rarely used for this purpose. Elevating the roads during construction minimizes the damage caused by flooding. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality.

The capability subclass is IVw. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8A.

BkB2—Braddock clay loam, 2 to 8 percent slopes, eroded. This map unit consists mainly of gently sloping, very deep, well drained Braddock and similar soils on high stream terraces. Individual areas are irregular in shape and range from 3 to 40 acres in size.

The typical sequence, depth, and composition of the layers of the Braddock soil are as follows—

Surface layer:
0 to 11 inches, reddish brown clay loam

Subsoil:
11 to 43 inches, red clay
43 to 57 inches, red clay loam

Underlying material:
57 to 60 inches, multicolored loam

Permeability is moderate. Surface runoff is medium. A crust may form on the surface after rainfall. It can cause ponding in concave areas or where outlets have been blocked. Maintaining good tilth is difficult because of a high content of clay and the crusting. Clods form if the soil is worked during wet periods. Crushing the clods is difficult. The crust and the clods interfere with seed germination. The seasonal high water table is more than 6 feet below the surface. The depth to bedrock is more than 72 inches. The organic matter content in the surface layer is low.

Included in mapping are small areas of Dillsboro and Saunook soils. These soils have a surface layer that is darker and contains less clay than that of the Braddock soil. Saunook soils have a loamy subsoil. They are in drainageways. Dillsboro soils have a subsoil that is browner than that of the Braddock soil. They are in

depressions. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Braddock soil but have a gravelly surface layer.

Much of the acreage in this map unit is used as pasture or hayland. Other uses include building site development, specialty crops, row crops, and woodland.

This map unit is well suited to pasture and hay. Alfalfa grows particularly well on this soil. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Grazing during wet periods causes severe compaction, increases the runoff rate, and reduces the rate of water infiltration. Keeping the pasture and hayland in good condition can help to control erosion.

This map unit is only moderately suited to building site development because of the restricted permeability and a moderate shrink-swell potential and high content of clay in the subsoil. This unit commonly is used for building site development because it is gently sloping, has scenic views, and is crossed by many roads. Erosion is a hazard.

This map unit is only moderately suited to specialty crops that are not commonly irrigated, such as apples and Christmas trees. Erosion is a hazard. White pine is grown for use as Christmas trees. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff.

This map unit is only moderately suited to row crops because of the hazard of erosion. The slope, poor tilth, droughtiness, and poor sources of irrigation water also are management concerns. The most common crops are corn for silage, small grain, sweet corn, and strawberries. Irrigation is needed for high-value crops, such as strawberries. Irrigating areas on high stream terraces is difficult because sources of water commonly are more than 300 feet away or more than 40 feet lower in elevation. Mulch is used in areas where strawberries are grown. It holds moisture, controls weeds, and keeps the berries clean. Minimum tillage and crop residue management increase the content of organic matter and the rate of water infiltration and improve tilth. Grassed field borders and grassed waterways can carry water safely away. Contour farming, stripcropping, and proper crop rotations conserve soil and water. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat.

This map unit is only moderately suited to woodland because of a high content of clay in the surface layer. An equipment limitation is a moderate management concern. This soil generally is not used for timber production because of the small size of the areas and the higher profits from crops, building site development, pasture, and hayland. The trees in the few wooded areas include scarlet oak, chestnut oak, black oak, white oak, eastern white pine, pitch pine, Virginia pine, and hickory.

This map unit is well suited to recreational uses, such as camp sites and picnic areas. It is rarely used for these purposes, however, because it is not near streams and generally has few trees and little shade.

This map unit is poorly suited to access roads because of low strength. It commonly is used for this purpose, however, because building site development is an important use. A high content of clay and the hazard of erosion are management concerns. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality.

The capability subclass is IIIe. Based on northern red oak as the indicator species, the woodland ordination symbol is 4C.

BkC2—Braddock clay loam, 8 to 15 percent slopes, eroded. This map unit consists mainly of strongly sloping, very deep, well drained Braddock and similar soils on high stream terraces. Individual areas are irregular in shape and range from 3 to 35 acres in size.

The typical sequence, depth, and composition of the layers of the Braddock soil are as follows—

Surface layer:
0 to 11 inches, reddish brown clay loam

Subsoil:
11 to 43 inches, red clay
43 to 57 inches, red clay loam

Underlying material:
57 to 60 inches, multicolored loam

Permeability is moderate. Surface runoff is rapid. Maintaining good tilth is difficult because of a high content of clay and crusting after rains. The crusting causes the runoff to be more rapid. Clods form if the soil is worked during wet periods. Crushing the clods is difficult. The crust and the clods interfere with seed germination. The seasonal high water table is more than 6 feet below the surface. The depth to bedrock is more than 72 inches. The organic matter content in the surface layer is low.

Included in mapping are small areas of Dillsboro and Saunook soils. These soils have a surface layer that is darker and contains less clay than that of the Braddock soil. Saunook soils have a loamy subsoil. They are in

drainageways. Dillsboro soils have a subsoil that is browner than that of the Braddock soil. They are in depressions. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Braddock soil but have a gravelly surface layer.

Much of the acreage in this map unit is used as pasture or hayland. Other uses include building site development, row crops, specialty crops, woodland, and recreational activities.

This map unit is well suited to pasture and hay. Alfalfa grows particularly well on this soil. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Grazing during wet periods causes compaction, increases the runoff rate, and reduces the rate of water infiltration. Keeping the pasture and hayland in good condition can help to control erosion.

This map unit is only moderately suited to building site development because of the slope, the restricted permeability, and a moderate shrink-swell potential and high content of clay in the subsoil. It commonly is used for building site development, however, because it has scenic views and is crossed by many roads. Erosion is a hazard.

This map unit is only moderately suited to row crops because of the hazard of erosion. The slope, poor tilth, droughtiness, and poor sources of irrigation water also are management concerns. The unit commonly is used for row crops, however, because the less sloping, highly productive soils are less available. The most common crops are corn for silage, small grain, sweet corn, and strawberries. Irrigation is needed for high-value crops, such as strawberries. Irrigating areas on high stream terraces is difficult because sources of irrigation water commonly are more than 300 feet away or more than 40 feet lower in elevation. Mulch is used in areas where strawberries are grown. It holds moisture, controls weeds, and keeps the berries clean. Minimum tillage and crop residue management increase the content of organic matter and the rate of water infiltration and improve tilth. Grassed field borders and grassed waterways can carry water safely away. Contour farming, stripcropping, and proper crop rotations conserve soil and water. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat.

This map unit is only moderately suited to specialty crops that are not commonly irrigated, such as apples and Christmas trees. The slope and the hazard of erosion are management concerns. White pine is grown for use as Christmas trees. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff.

This map unit is only moderately suited to woodland because of a high content of clay in the surface layer. An equipment limitation is a moderate management concern. This unit is not used for timber production because of the small size of the areas and the higher profits from crops, building site development, pasture, and hayland. The trees in the few wooded areas include scarlet oak, chestnut oak, black oak, white oak, eastern white pine, pitch pine, Virginia pine, and hickory.

This map unit is only moderately suited to recreational uses, such as camp sites and picnic areas. It is rarely used for these purposes because it is not near streams and has few trees and little shade. The slope and the hazard of erosion are management concerns.

This map unit is poorly suited to access roads because of low strength. It commonly is used for this purpose, however, because building site development is an important use. A high content of clay and the hazard of erosion are management concerns. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality.

The capability subclass is IVe. Based on northern red oak as the indicator species, the woodland ordination symbol is 4C.

BrC—Braddock-Urban land complex, 2 to 15 percent slopes. This map unit occurs mainly as areas of a gently sloping to strongly sloping, well drained, very deep Braddock soil and areas of Urban land. The unit is on high stream terraces. Most areas of the unit are near Franklin. Individual areas range from about 5 to 60 acres in size. Typically, they are about 30 to 40 percent Braddock soil and 30 to 40 percent Urban land. The Braddock soil and Urban land occur as areas too intricately mixed to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Braddock soil are as follows—

Surface layer:
0 to 11 inches, reddish brown clay loam

Subsoil:
11 to 43 inches, red clay
43 to 57 inches, red clay loam

Underlying material:
57 to 60 inches, multicolored loam

Urban land consists of impervious areas that are covered with buildings, streets, sidewalks, driveways, and parking lots.

Permeability is moderate in the Braddock soil. Available water capacity also is moderate. The organic matter content in the surface layer is low. The depth to bedrock is more than 72 inches. Surface runoff is rapid because of the large amount of impervious Urban land and a sparse plant cover on the Braddock soil. Water is concentrated in concave areas, and channel flow is common during storms.

Included in mapping are areas where some or all of the natural soil has been altered or covered as a result of grading and digging. Around many commercial buildings, grading, cutting, and filling have been extensive. Around some homes the disturbance is largely in the form of soil compaction. Also included are small areas of Dillsboro, Evard, Hayesville, and Saunook soils; areas that are stony; and areas where the slope is more than 15 percent. Dillsboro and Saunook soils have a surface layer that is darker and contains less clay than that of the Braddock soil. Evard and Saunook soils have a loamy subsoil. Hayesville soils formed in material weathered from the underlying bedrock. Dillsboro soils are in depressions. Saunook soils are in drainageways. Evard soils are in the more sloping areas. Contrasting inclusions make up about 25 percent of this map unit.

Much of the acreage in this map unit is used for urban development. The slope, the hazard of erosion, a moderate shrink-swell potential, a high content of clay, and the restricted permeability in the Braddock soil are management concerns. Generally, little topsoil remains in areas of this unit. Runoff should be controlled and erosion minimized. Generally, landscaping in areas of the Braddock soil involves the use of soil material that has a high content of clay and poor physical properties. In some areas compaction of the soil material further adds to the problems of landscaping. Selection of drought-resistant species for planting, irrigation, additions of mulch, and applications of fertilizer and lime may be needed to establish landscaping plants. Outlets are needed to prevent ponding, especially in concave areas formed by landscaping.

The capability subclass is IVe in areas of the Braddock soil and VIIIs in areas of the Urban land. This map unit has not been assigned a woodland ordination symbol.

BrD—Braddock-Urban land complex, 15 to 30 percent slopes. This map unit occurs mainly as areas of a moderately steep, well drained, very deep Braddock soil and areas of Urban land. The unit is on high stream terraces. Nearly all areas of the unit are near Franklin. Individual areas range from about 5 to 20 acres in size. Typically, they are about 30 to 40 percent Braddock soil and 20 to 30 percent Urban land. The Braddock soil and Urban land occur as areas too intricately mixed to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Braddock soil are as follows—

Surface layer:
0 to 11 inches, reddish brown clay loam

Subsoil:
11 to 43 inches, red clay
43 to 57 inches, red clay loam

Underlying material:
57 to 60 inches, multicolored loam

Urban land consists of impervious areas that are covered with buildings, streets, sidewalks, driveways, and parking lots.

Permeability is moderate in the Braddock soil. Available water capacity also is moderate. The organic matter content in the surface layer is low. The depth to bedrock is more than 72 inches. Surface runoff is very rapid because of the large amount of impervious Urban land and a sparse plant cover on the Braddock soil. Water is concentrated in concave areas, and channel flow is common during storms.

Included in mapping are areas where some or all of the natural soil has been altered or covered as a result of grading and digging. Around many commercial buildings, grading, cutting, and filling have been extensive. Around some homes the disturbance is largely in the form of soil compaction. Also included are small areas of Dillsboro, Evard, Hayesville, and Saunook soils; small areas that are stony; and areas where the slope is more than 30 percent. Dillsboro and Saunook soils have a surface layer that is darker and contains less clay than that of the Braddock soil. Also, Dillsboro soils have a browner subsoil. Evard and Saunook soils have a loamy subsoil. Hayesville soils formed in material weathered from the underlying bedrock. Dillsboro soils are in depressions. Saunook soils are in drainageways. Evard soils are in the more sloping areas. Contrasting inclusions soils make up about 35 percent of this map unit.

Much of the acreage in this map unit is used for urban development. The slope, the hazard of erosion, a moderate shrink-swell potential, a high content of clay, and restricted permeability in the Braddock soil are management concerns. Generally, little topsoil remains in areas of this unit. Runoff should be controlled and erosion minimized. Generally, landscaping in areas of the Braddock soil involves the use of soil material that

has a high content of clay and poor physical properties. In some areas compaction of the soil material further adds to the problems of landscaping. Selection of drought-resistant species for planting, irrigation, additions of mulch, and applications of fertilizer and lime may be needed to establish landscaping plants. Outlets are needed to prevent ponding, especially in concave areas formed by landscaping.

The capability subclass is VIe in areas of the Braddock soil and VIIIs in areas of the Urban land. This map unit has not been assigned a woodland ordination symbol.

BsC—Brasstown-Junaluska complex, 8 to 15 percent slopes. This map unit consists mainly of strongly sloping, well drained Brasstown and Junaluska soils on narrow ridgetops in the low mountains. The Brasstown soil is deep, and the Junaluska soil is moderately deep. Individual areas range from 5 to 30 acres in size. Typically, they are 40 to 50 percent Brasstown soil and 30 to 40 percent Junaluska soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Brasstown soil are as follows—

Surface layer:
0 to 6 inches, reddish brown loam

Subsoil:
6 to 12 inches, red loam
12 to 36 inches, red clay loam
36 to 45 inches, red loam

Weathered bedrock:
45 to 60 inches, multicolored metasandstone

The typical sequence, depth, and composition of the layers of the Junaluska soil are as follows—

Surface layer:
0 to 5 inches, yellowish red channery fine sandy loam

Subsoil:
5 to 21 inches, red sandy clay loam

Underlying material:
21 to 36 inches, multicolored flaggy fine sandy loam

Weathered bedrock:
36 to 45 inches, multicolored metasandstone

Permeability is moderate in the Brasstown and Junaluska soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and medium in areas without forest litter. The depth to weathered bedrock is 40 to 60 inches in the Brasstown soil and 20 to 40 inches in the Junaluska soil. The organic matter content in the surface layer of both soils ranges from low to high.

Included in mapping are small areas of Soco and Stecoah soils. These soils have less clay in the subsoil than the Brasstown and Junaluska soils. Soco and Stecoah soils are on north- and east-facing slopes. Also included are areas of soils that have weathered bedrock at a depth of less than 20 inches. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Brasstown and Junaluska soils but have a browner subsoil or more stones on the surface.

Much of the acreage in this map unit is used as pasture or hayland. Other uses include woodland, building site development, and recreational activities.

This map unit is well suited to pasture and hay. Difficult access across steep terrain and the hazard of erosion are management concerns. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Keeping the pasture and hayland in good condition helps to control erosion.

This map unit is well suited to woodland. It produces a lower volume of timber, however, and has fewer valuable species than highly productive soils, such as Cheoah soils. The most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, pitch pine, Virginia pine, and hickory. Windblown seeds from such species as black locust, red maple, pitch pine, Virginia pine, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good. Hardwood seedlings are favored on sites where the amount of annual rainfall is more than 60 inches. Reforestation of hardwoods occurs dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. It is generally planted where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

Care is needed to prevent soil compaction. The use of heavy equipment should be restricted to dry periods. When the soils are wet, skid trails and unsurfaced roads are soft and slick because of the clay content.

This map unit is only moderately suited to building site development because of the slope, the depth to bedrock, and the restricted permeability. The hazard of erosion and difficult access across steep terrain are management concerns. Excavation for dwellings with basements may be hampered by the depth to bedrock in the Junaluska soil. In some areas the Junaluska soil is too shallow to be used as a site for septic tank absorption fields.

This map unit is well suited to hiking trails. It is only moderately suited to most other recreational uses because of the slope. The hazard of erosion also is a management concern. Freezing and thawing increase the need for trail maintenance on south- and west-facing slopes.

This map unit is not used for row crops or specialty crops. The slope, the hazard of erosion, difficult access across steep terrain, and droughtiness are management concerns.

This map unit is only moderately suited to access roads because of low strength, the slope, and frost action. It is used for this purpose because timber production and building site development are important uses. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating disturbed areas is difficult, especially on south- and west-facing slopes that freeze and thaw in spring and fall.

The capability subclass is IVe. Based on scarlet oak as the indicator species, the woodland ordination symbol is 4A in areas of the Brasstown soil and 3D in areas of the Junaluska soil.

BsD—Brasstown-Junaluska complex, 15 to 30 percent slopes. This map unit consists mainly of moderately steep, well drained Brasstown and Junaluska soils on sides slopes and narrow ridgetops in the low mountains. The Brasstown soil is deep, and the Junaluska soil is moderately deep. Individual areas range from 5 to 50 acres in size. Typically, they are 35 to 45 percent Brasstown soil and 35 to 45 percent Junaluska soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Brasstown soil are as follows—

Surface layer:
0 to 6 inches, reddish brown loam

Subsoil:
6 to 12 inches. red loam
12 to 36 inches, red clay loam
36 to 45 inches, red loam

Weathered bedrock:
45 to 60 inches, multicolored metasandstone

The typical sequence, depth, and composition of the layers of the Junaluska soil are as follows—

Surface layer:
0 to 5 inches, yellowish red channery fine sandy loam

Subsoil:
5 to 21 inches, red sandy clay loam

Underlying material:
21 to 36 inches, multicolored flaggy fine sandy loam

Weathered bedrock:
36 to 45 inches, multicolored metasandstone

Permeability is moderate in the Brasstown and Junaluska soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to weathered bedrock is 40 to 60 inches in the Brasstown soil and 20 to 40 inches in the Junaluska soil. The organic matter content in the surface layer ranges from low to high.

Included in mapping are small areas of Santeetlah, Soco, Spivey, and Stecoah soils. Santeetlah and Spivey soils have a darker surface layer than that of the Brasstown and Junaluska soils, and Soco and Stecoah soils have less clay in the subsoil. Spivey soils have more than 35 percent rock fragments in the subsoil. Santeetlah and Spivey soils are in drainageways. Soco and Stecoah soils are on north- and east-facing slopes. Also included are small areas of soils that have weathered bedrock at a depth of less than 20 inches. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Brasstown and Junaluska soils but have a browner subsoil or more stones on the surface.

Much of the acreage in this map unit is used as woodland. Other uses include pasture, building site development, and recreational activities.

This map unit is only moderately suited to woodland because of the slope. The hazard of erosion and an equipment limitation are moderate management concerns. Difficult access across steep terrain and soil compaction are additional management concerns. This unit produces a lower volume of timber and has fewer valuable species than highly productive soils, such as Cheoah soils. The most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, pitch pine, Virginia pine, and hickory. Windblown seeds from such species as black locust, red maple, pitch pine, Virginia pine, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good. Hardwood seedlings are favored on sites where the amount of annual rainfall is more than 60 inches. Reforestation of hardwoods is dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. It is generally planted where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

Care is needed to prevent soil compaction. The use of heavy equipment should be restricted to dry periods. When the soils are wet, skid trails and unsurfaced roads are soft and slick because of a high content of clay.

This map unit is only moderately suited to pasture because of the slope. Difficult access across steep terrain and the hazard of erosion also are management concerns. Operating farm equipment is difficult because of the slope. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Keeping the pasture in good condition helps to control erosion.

This map unit is poorly suited to building site development because of the slope and the depth to bedrock. The hazard of erosion and difficult access across steep terrain also are management concerns. Revegetating disturbed areas is difficult because of the slope and freezing and thawing. Hydroseeding is a good way to revegetate steep banks. Excavation for dwellings with basements may be hampered by the moderate depth to bedrock in the Junaluska soil. In some areas the Junaluska soil is too shallow to be used as a site for septic tank absorption fields.

This map unit is only moderately suited to hiking trails. The hazard of erosion is a management concern. Freezing and thawing increase the need for trail maintenance on south- to west-facing slopes.

This map unit is not used for row crops or specialty crops.

This map unit is poorly suited to access roads because of the slope. It commonly is used this purpose, however, because timber production and building site development are important uses. The instability of the underlying bedrock, difficult access across steep terrain, and the hazard of erosion are management concerns. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating areas that have been cut and filled is difficult because of the slope and slumping, especially on south- to west-facing slopes that freeze and thaw in spring and fall. Hydroseeding is a good way to revegetate steep roadbanks. Building the roadbed on natural soil minimizes slumping. The underlying bedrock is susceptible to mass movement, especially during periods of heavy rainfall and high traffic. The orientation of the dip in the rock as it relates to the roadbed greatly affects the likelihood of mass movement occurring. Placing a slight tilt in the roadbed so that water flows off the downhill side is a better way to remove water than ditches, which are impractical because banks slump. Large amounts of ultra acid, sulfur-bearing rock may be exposed by road building. Water seeping through or flowing over this rock may enter nearby streams and kill aquatic life. Preventing damage to the aquatic life requires special treatment of the exposed areas. A plant cover is required to control freezing and thawing of fill material. Lime and fertilizer are required to establish and maintain vegetation.

The capability subclass is VIe. Based on scarlet oak as the indicator species, the woodland ordination symbol is 4R in areas of the Brasstown soil and 3R in areas of the Junaluska soil.

BsE—Brasstown-Junaluska complex, 30 to 50 percent slopes. This map unit consists mainly of steep, well drained Brasstown and Junaluska soils on sides slopes and very narrow ridgetops in the low mountains. The Brasstown soil is deep, and the Junaluska soil is moderately deep. Individual areas range from 5 to 60 acres in size. Typically, they are 40 to 50 percent Brasstown soil and 30 to 40 percent Junaluska soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Brasstown soil are as follows—

Surface layer:
0 to 6 inches, reddish brown loam

Subsoil:
6 to 12 inches, red loam
12 to 36 inches, red clay loam
36 to 45 inches, red loam

Weathered bedrock:
45 to 60 inches, multicolored metasandstone

The typical sequence, depth, and composition of the layers of the Junaluska soil are as follows—

Surface layer:
0 to 5 inches, yellowish red channery fine sandy loam

Subsoil:
5 to 21 inches, red sandy clay loam

Underlying material:
21 to 36 inches, multicolored flaggy fine sandy loam

Weathered bedrock:
36 to 45 inches, multicolored metasandstone

Permeability is moderate in the Brasstown and Junaluska soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid or very rapid in areas without forest litter. The depth to weathered bedrock is 40 to 60 inches in the Brasstown soil and 20 to 40 inches in the Junaluska soil. The organic matter content in the surface layer ranges from low to high. Landslides occur on this map unit.

Included in mapping are small areas of Santeetlah, Soco, Spivey, and Stecoah soils. Santeetlah and Spivey soils have a darker surface layer than that of the Brasstown and Junaluska soils, and Soco and Stecoah soils have less clay in the subsoil. Spivey soils have more than 35 percent rock fragments in the subsoil. Santeetlah and Spivey soils are in drainageways. Soco and Stecoah soils are on north- to east-facing slopes. Also included are areas of soils that have weathered bedrock at a depth of less than 20 inches. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Brasstown and Junaluska soils but have a browner subsoil or more stones on the surface.

Much of the acreage in this map unit is used as woodland. Other uses include pasture, recreation, and building site development.

This map unit is poorly suited to woodland because of the slope. The hazard of erosion and an equipment limitation are severe management concerns. Soil compaction is an additional problem. These soils produce a lower volume of timber and have fewer valuable species than highly productive soils, such as Cheoah soils. The most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, pitch pine, Virginia pine, and hickory. Windblown seeds from such species as black locust, red maple, pitch pine, Virginia pine, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good. Hardwood seedlings are favored on sites where the amount of annual rainfall is more than 60 inches. Reforestation of hardwoods is dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. It is generally planted where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

Care is needed to prevent soil compaction. The use of heavy equipment should be restricted to dry periods. When the soils are wet, skid trails and unsurfaced roads are soft and slick because of a high content of clay.

This map unit is poorly suited to pasture because of the slope. The hazard of erosion also is a management concern. Operating farm equipment is dangerous because of the slope. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Keeping the pasture in good condition helps to control erosion. Generally, weeds are controlled and fertilizer and lime are applied by hand.

This map unit is poorly suited to overlooks and hiking trails. The hazard of erosion is a management concern. Freezing and thawing increase the need for trail maintenance on south- and west-facing slopes.

This map unit is poorly suited to building site development because of the slope and the depth to bedrock. The hazard of erosion also is a management concern. Revegetating disturbed areas is difficult, mainly because of the slope. Hydroseeding is a good way to revegetate steep cutbanks. Excavation for dwellings with basements may be hampered by the moderate depth to bedrock in the Junaluska soil. Septic tank absorption fields should be dug by hand because of the slope. In some areas the Junaluska soil is too shallow to be used as a site for septic tank absorption fields.

This map unit is not used for row crops or specialty crops.

This map unit is poorly suited to access roads because of the slope. It is used for this purpose, however, because timber production is an important use. The instability of the underlying bedrock and the hazard of erosion are management concerns. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating large areas that have been cut and filled is difficult because of the slope and slumping, especially on south-

to west-facing slopes that freeze and thaw in spring and fall. Hydroseeding is a good way to revegetate steep roadbanks. Building the roadbed on natural soil minimizes slumping. The underlying bedrock is susceptible to mass movement, especially during periods of heavy rainfall and high traffic. The orientation of the dip in the rock as it relates to the roadbed greatly affects the likelihood of mass movement occurring. Placing a slight tilt in the roadbed so that water flows off the downhill side is a better way to remove water than ditches, which are impractical because banks slump. Large amounts of ultra acid, sulfur-bearing rock may be exposed by road building. Water seeping through or flowing over this rock may enter nearby streams and kill aquatic life. A plant cover is required to control freezing and thawing of fill material. Lime and fertilizer are required to establish and maintain vegetation.

The capability subclass is VIIe. Based on scarlet oak as the indicator species, the woodland ordination symbol is 4R in areas of the Brasstown soil and 3R in areas of the Junaluska soil.

BsF—Brasstown-Junaluska complex, 50 to 95 percent slopes. This map unit consists mainly of very steep, well drained Brasstown and Junaluska soils on side slopes in the low mountains. The Brasstown soil is deep, and the Junaluska soil is moderately deep. Individual areas range from 10 to 80 acres in size. Typically, they are 40 to 50 percent Brasstown soil and 30 to 40 percent Junaluska soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Brasstown soil are as follows—

Surface layer:
0 to 6 inches, reddish brown loam

Subsoil:
6 to 12 inches, red loam
12 to 36 inches, red clay loam
36 to 45 inches, red loam

Weathered bedrock:
45 to 60 inches, multicolored metasandstone

The typical sequence, depth, and composition of the layers of the Junaluska soil are as follows—

Surface layer:
0 to 5 inches, yellowish red channery fine sandy loam

Subsoil:
5 to 21 inches, red sandy clay loam

Underlying material:
21 to 36 inches, multicolored flaggy fine sandy loam

Weathered bedrock:
36 to 45 inches, multicolored metasandstone

Permeability is moderate in the Brasstown and Junaluska soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid or very rapid in areas without forest litter. The depth to weathered bedrock is 40 to 60 inches in the Brasstown soil and 20 to 40 inches in the Junaluska soil. The organic matter content in the surface layer ranges from low to high. Landslides occur on this map unit.

Included in mapping are small areas of Santeetlah, Soco, Spivey, and Stecoah soils. Santeetlah and Spivey soils have a darker surface layer than that of the Brasstown and Junaluska soils, and Soco and Stecoah soils have less clay in the subsoil. Spivey soils have more than 35 percent rock fragments in the subsoil. Santeetlah and Spivey soils are in drainageways. Soco and Stecoah soils are on north- to east-facing slopes. Also included are areas of soils that have weathered bedrock at a depth of less than 20 inches. Contrasting inclusions make up about 20 percent of this map unit.

Nearly all of the acreage in this map unit is used as woodland.

This map unit is poorly suited to woodland because of the slope. The hazard of erosion and an equipment limitation are severe management concerns. Soil compaction is an additional problem. This unit produces a lower volume of timber and has fewer valuable species than highly productive soils, such as Cheoah soils. The most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, pitch pine, Virginia pine, and hickory. Windblown seeds from such species as black locust, red maple, pitch pine, Virginia pine, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good. Hardwood seedlings are favored on sites where the amount of annual rainfall is more than 60 inches. Reforestation of hardwoods is dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. It is generally planted where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Hardwood

competition may need to be controlled again a few years after planting.

The slope restricts the kinds of equipment that can be used. Operating wheeled or tracked equipment is dangerous because of the slope. Cable yarding is safer, disturbs the soil less, and helps to maintain productivity. When the soils are wet, unsurfaced roads are soft, slick, and dangerous because of the content of clay.

This map unit is poorly suited to hiking trails. Erosion is a hazard on these trails. Freezing and thawing increase the need for trail maintenance on south- and west-facing slopes.

This map unit is not used for pasture, building site development, or crops because of the slope.

This map unit is poorly suited to access roads because of the slope. It is used for this purpose, however, because timber production is a use. The instability of the underlying bedrock is a management concern. Building and maintaining roads are difficult and expensive. Road construction results in large cuts and fills. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating disturbed areas is difficult because of the slope and slumping, especially on south- and west-facing slopes that freeze and thaw in spring and fall. Hydroseeding is a good way to revegetate steep roadbanks. The underlying bedrock is susceptible to mass movement, especially during periods of heavy rainfall and high traffic. Also, if a load is applied to the soil when it is saturated during the wet season, the soil can slide off the rock contact. The orientation of the dip in the rock as it relates to the roadbed greatly affects the likelihood of mass movement occurring. Building the roadbed on natural soil minimizes slumping. Placing a slight tilt in the roadbed so that water flows off the downhill side is a better way to manage water than ditches, which are impractical because banks slump. Large amounts of ultra acid, sulfur-bearing rock may be exposed by road building. Water seeping through or flowing over this rock may enter nearby streams and kill aquatic life. Preventing damage to the aquatic life requires special treatment of the exposed areas.

The capability subclass is VIIe. Based on scarlet oak as the indicator species, the woodland ordination symbol is 4R in areas of the Brasstown soil and 3R in areas of the Junaluska soil.

BuD—Burton-Craggey-Rock outcrop complex, windswept, 15 to 30 percent slopes, stony. This moderately steep map unit occurs mainly as areas of a moderately deep, well drained Burton soil; a shallow, somewhat excessively drained Craggy soil; and Rock outcrop. The unit is on moderately broad ridgetops in the high mountains. Scattered stones and boulders are on the surface. Individual areas are irregular in shape and range from 5 to 40 acres in size. Typically, they are 35 to 45 percent Burton soil, 25 to 35 percent Craggey soil, and 10 to 20 percent Rock outcrop. The two soils and Rock outcrop occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Burton soil are as follows—

Surface layer:
- 0 to 7 inches, black sandy loam
- 7 to 13 inches, very dark brown sandy loam
- 13 to 18 inches, very dark grayish brown sandy loam

Subsoil:
- 18 to 24 inches, dark yellowish brown cobbly sandy loam

Underlying material:
- 24 to 36 inches, yellowish brown cobbly sandy loam

Hard bedrock:
- 36 inches, mica gneiss

The typical sequence, depth, and composition of the layers of the Craggey soil are as follows—

Surface layer:
- 0 to 8 inches, black cobbly sandy loam
- 8 to 11 inches, very dark grayish brown cobbly sandy loam

Subsoil:
- 11 to 17 inches, dark yellowish brown cobbly sandy loam

Hard bedrock:
- 17 inches, mica gneiss

Permeability is moderately rapid in the Burton and Craggy soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to hard bedrock is 20 to 40 inches in the Burton soil and 10 to 20 inches in the Craggey soil. The organic matter content in the surface layer is very high. The climate is severe. Winter is cold, icy, and windy. The rest of the year is rainy, foggy, and cool. The Burton and Craggy soils are frozen for long periods in the winter.

Included in mapping are small areas of Wayah soils. These soils are very deep and are in saddles. They make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Burton and Craggey soils but have a dark surface layer that is less than 10 or more than 20 inches thick or have fewer stones on the surface.

Where the surface layer is less than 10 inches thick, the soils are on nose slopes or shoulder slopes. Where the surface layer is more than 20 inches thick, the soils are in saddles.

Most of the acreage in this map unit is wooded. A few balds are covered with rhododendron and blueberry. Some areas are used for recreational activities or building site development. In most areas traversing the landscape is difficult and dangerous.

This map unit is poorly suited to woodland because of the severe climatic conditions, which cause low productivity. The slope, the depth to bedrock, stones, numerous areas of Rock outcrop, and the hazard of erosion also are management concerns. This unit is not used for timber production because trees are stunted, twisted, or otherwise damaged by wind and ice. Northern red oak is the most common tree. Other trees include a few sugar maple, sweet birch, and yellow birch.

This map unit is poorly suited to recreational uses, such as overlooks and hiking trails. Overlooks and hiking trails are important uses of the unit, however, because of scenic views. The slope, the depth to bedrock, and the hazard of erosion are management concerns. Freezing and thawing increase the need for trail maintenance.

This map unit is poorly suited to building site development because of the depth to bedrock and the slope. Stones, numerous areas of Rock outcrop, and the hazard of erosion also are management concerns. This unit is used for building site development, however, because it has scenic views. Because of cold winter temperatures and high winds, these sites are used mainly for summer homes. The hazard of ground-water contamination or stream pollution is severe. Installing septic tank absorption fields is difficult because of the depth to which the soil freezes and the depth to bedrock. The absorption fields should be dug by hand because of the slope. Excavation for dwellings with basements is hampered by the depth to hard bedrock. Revegetating disturbed areas is difficult and expensive. Hydroseeding is a good way to revegetate steep cutbanks. This map unit is in areas where the amount of annual rainfall exceeds 70 inches. Revegetating building sites as soon as possible helps to control erosion in these areas.

This map unit is not used for crops or pasture because of the slope and the cold climate. Stones, the depth to bedrock, and the hazard of erosion also are management concerns.

This map unit is poorly suited to access roads because of the depth to bedrock and the slope. Numerous areas of Rock outcrop, freezing and thawing of roadbanks, and the hazard of erosion also are management concerns. This unit is used for access roads, however, because building site development is an important use. Building and maintaining the roads are difficult and expensive. Damage to road surfaces is severe because of the climate. Because of a scarcity of soil material, grading the roadbeds is difficult. Drilling and blasting of the hard bedrock are commonly needed. Building the roadbed on natural soil minimizes slumping. Because unsurfaced roads are slick when wet, surfacing is required for year-round use. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating areas that have been cut and filled is difficult, mostly because of freezing and thawing in spring and fall. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIe in areas of the Burton soil, VIIs in areas of the Craggey soil, and VIIIs in areas of the Rock outcrop. Based on northern red oak as the indicator species, the woodland ordination symbol is 2R in areas of the Burton soil and 2D in areas of the Craggey soil. The Rock outcrop has not been assigned a woodland ordination symbol.

BuF—Burton-Craggey-Rock outcrop complex, windswept, 30 to 95 percent slopes, stony. This steep to very steep map unit occurs mainly as areas of a moderately deep, well drained Burton soil; a shallow, somewhat excessively drained Craggey soil; and Rock outcrop. The unit is on head slopes and steep ridgetops in the high mountains. Scattered stones and boulders are on the surface. Individual areas range from 10 to 80 acres in size. Typically, they are 35 to 45 percent Burton soil, 25 to 35 percent Craggey soil, and 10 to 20 percent Rock outcrop. The two soils and Rock outcrop occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Burton soil are as follows—

Surface layer:
- 0 to 7 inches, black sandy loam
- 7 to 13 inches, very dark brown sandy loam
- 13 to 18 inches, very dark grayish brown sandy loam

Subsoil:
- 18 to 24 inches, dark yellowish brown cobbly sandy loam

Underlying material:
- 24 to 36 inches, yellowish brown cobbly sandy loam

Hard bedrock:
- 36 inches, mica gneiss

The typical sequence, depth, and composition of the layers of the Craggey soil are as follows—

Surface layer:

0 to 8 inches, black cobbly sandy loam

8 to 11 inches, very dark grayish brown cobbly sandy loam

Subsoil:

11 to 17 inches, dark yellowish brown cobbly sandy loam

Hard bedrock:

17 inches, mica gneiss

Permeability is moderately rapid in the Burton and Craggy soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to hard bedrock is 20 to 40 inches in the Burton soil and 10 to 20 inches in the Craggey soil. The organic matter content in the surface layer of both soils is very high. The climate is severe. Winter is cold, icy, and windy. The rest of the year is rainy, foggy, and cool. The Burton and Craggy soils are frozen for long periods in the winter.

Included in mapping are small areas of Cullasaja and Wayah soils. These soils are very deep. Cullasaja soils have more than 35 percent rock fragments in the subsoil. They are in drainageways. Wayah soils are in saddles and on foot slopes. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Burton and Craggey soils but have a dark surface layer that is less than 10 or more than 20 inches thick or have fewer stones on the surface. Where the surface layer is less than 10 inches thick, the soils are on nose slopes or shoulder slopes of the ridges. Where the surface layer is more than 20 inches thick, the soils are in saddles.

Most of the acreage in this map unit is wooded. A few balds are covered with rhododendron and blueberry. Some areas are used for recreational activities or building site development. In most areas traversing the landscape is difficult and dangerous.

This map unit is poorly suited to woodland because of the severe climatic conditions, which cause low productivity; the slope; and the depth to bedrock. The unit is not used for timber production. Trees are stunted, twisted, or otherwise damaged by wind and ice. Stones, numerous areas of Rock outcrop, and the hazard of erosion are management concerns. Northern red oak is the most common tree. Other trees include a few sugar maple, sweet birch, and yellow birch.

This map unit is poorly suited to recreational uses, such as overlooks and hiking trails. The slope, the depth to bedrock, and the hazard of erosion are management concerns. Freezing and thawing increase the need for trail maintenance.

This map unit is poorly suited to building site development because of the depth to bedrock and the slope. Stones, numerous areas of Rock outcrop, and the hazard of erosion also are management concerns. Some areas near the town of Highlands are used as building sites because of scenic views. Because of cold winter temperatures and high winds, these sites are used mainly for summer homes. The hazard of ground-water contamination or stream pollution is severe. Installing septic tank absorption fields is difficult because of the depth to which the soils freeze and the depth to bedrock. The absorption fields should be dug by hand because of the slope. Excavation for dwellings with basements is hampered by the depth to hard bedrock. Revegetating disturbed areas is difficult and expensive. Hydroseeding is a good way to revegetate steep cutbanks. This map unit is in areas where the amount of annual rainfall exceeds 70 inches. Revegetating building sites as soon as possible helps to control erosion in these areas.

This map unit is not used for crops or pasture. The slope is the main management concern. Stones, the depth to bedrock, numerous areas of Rock outcrop, and the hazard of erosion also are management concerns.

This map unit is poorly suited to access roads because of the slope and the depth to bedrock. Numerous areas of Rock outcrop, freezing and thawing of roadbanks, and the hazard of erosion also are management concerns. Areas of the unit are used for access roads if the value of building sites is very high and other access is not available. Building and maintaining the roads are difficult and expensive. Damage to road surfaces is severe because of the climate. Because of a scarcity of soil material, grading the roadbeds is difficult. Drilling and blasting of the hard bedrock are commonly needed. Building the roadbed on natural soil minimizes slumping. Because unsurfaced roads are slick when wet, surfacing is required for year-round use. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating areas that have been cut and filled is difficult, mostly because of freezing and thawing in spring and fall. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIIe in areas of the Burton soil, VIIs in areas of the Craggey soil, and VIIIs in areas of the Rock outcrop. Based on northern red oak as the indicator species, the woodland ordination symbol is 2R in areas of the Burton and Craggy soils. The Rock outcrop has not been assigned a woodland ordination symbol.

CaE—Cashiers gravelly fine sandy loam, 30 to 50 percent slopes. This map unit consists mainly of steep, very deep, well drained Cashiers and similar soils on north- to east-facing head slopes and side slopes in low and intermediate mountains. Individual areas are irregular in shape and range from 5 to 60 acres in size.

The typical sequence, depth, and composition of the layers of the Cashiers soil are as follows—

Surface layer:
0 to 8 inches, dark brown gravelly fine sandy loam

Subsoil:
8 to 31 inches, yellowish brown fine sandy loam
31 to 49 inches, brownish yellow fine sandy loam

Underlying material:
49 to 60 inches, multicolored sandy loam

Permeability is moderately rapid. Surface runoff is slow in areas where undisturbed forest litter is on the surface and very rapid in areas without forest litter. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is high or very high. The underlying material has a very high content of mica. It cannot be easily stabilized, compacted, or vegetated and is extremely erodible.

Included in mapping are small areas of Chandler, Cullasaja, Fannin, and Tuckasegee soils. Chandler and Fannin soils have a surface layer that is thinner or lighter in color than that of the Cashiers soil. Also, Fannin soils have more clay in the subsoil. Cullasaja soils have more than 35 percent rock fragments in the subsoil. Cullasaja and Tuckasegee soils contain less mica than the Cashiers soil and are in drainageways. Chandler and Fannin soils are on south- to west-facing slopes. Also included are small areas of rock outcrop. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Cashiers soil but have a redder subsoil or a dark surface layer that is more than 10 inches thick.

Much of the acreage in this map unit is used as woodland. Other uses include pasture, specialty crops, and building site development.

This map unit is poorly suited to woodland because of the slope. The hazard of erosion and an equipment limitation are severe management concerns. The instability of the underlying material also is a management concern. This unit is desirable for timber production, however, because of high productivity and valuable species. It commonly is used for this purpose on National Forest lands. Privately owned areas are rarely used for timber production because of a high potential value for building site development. The most common trees are yellow-poplar, northern red oak, black cherry, sweet birch, and sugar maple. Yellow-poplar is common at the lower elevations. Yellow birch, American beech, and eastern hemlock are common at the upper elevations. Scarlet oak, white oak, black oak, and hickory are common on severely high-graded sites. Windblown seeds from such species as yellow-poplar, black locust, sugar maple, eastern hemlock, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good and hardwood seedlings are available. Reforestation of hardwoods is dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

Care is needed to prevent soil compaction. The use of wheeled and tracked equipment is difficult because of the slope. The use of heavy equipment should be restricted to dry periods or to periods when the ground is frozen. When the soil is wet, skid trails and unsurfaced roads are extremely erodible and very slick because of the high content of mica.

This map unit is poorly suited to pasture because of the slope. The hazard of erosion also is a management concern. Operating farm equipment is dangerous because of the slope. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Generally, weeds are controlled and fertilizer and lime are applied by hand. Keeping the pasture in good condition helps to control erosion. Cool season grasses, such as tall fescue and orchardgrass, can provide late summer pasture.

This map unit is poorly suited to specialty crops, such as landscaping plants and Christmas trees. The slope and the hazard of erosion are the main management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, and rhododendron. Fraser fir is grown for use as Christmas trees. Specialty crops generally are not grown outside the areas of high rainfall. Operating farm

equipment is dangerous because of the slope. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff.

This map unit is poorly suited to building site development because of the slope. The instability of the underlying material and the hazard of erosion also are management concerns. Because of cold winter temperatures, building sites are used mainly for summer homes. Caving of cutbanks is a hazard during excavation because of the very high content of mica in the underlying material. Because of the slope, septic tank absorption fields should be dug by hand and revegetating disturbed areas is difficult. Hydroseeding is a good way to revegetate steep cutbanks. This map unit is in areas where the amount of annual rainfall exceeds 70 inches. Revegetating building sites as soon as possible helps to control erosion in these areas.

This map unit is poorly suited to recreational uses, such as hiking trails. The slope and the hazard of erosion are management concerns. The trails are very slick during rainy periods.

This map unit is not used for row crops. The slope and the hazard of erosion are management concerns.

This map unit is poorly suited to access roads because of the slope, frost action, and low strength. The hazard of erosion, the instability of the underlying material, and difficulty in compacting the soil also are management concerns. This unit commonly is used for access roads, however, because timber production and building site development are important uses. Access roads are difficult and expensive to built and maintain. Because unvegetated and unsurfaced roadbeds are slick when wet and are easily eroded, surfacing and continuous maintenance are required for year-round use. Building the roadbed on natural soil minimizes slumping. Compacting the underlying material for use in roadbeds is very difficult. Placing a slight tilt in the roadbed so that water flows off the downhill side is a better way to remove water than ditches, which are impractical because banks slump. This soil requires more culverts, broad-based dips, and water bars to control water than soils that have a lower content of mica. These measures allow water to be diverted to outlets more often and in smaller amounts. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating and maintaining large areas that have been cut and filled are difficult. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIIe. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 7R.

CaF—Cashiers gravelly fine sandy loam, 50 to 95 percent slopes. This map unit consists mainly of very steep, very deep, well drained Cashiers and similar soils on north- to east-facing head slopes and side slopes in the low and intermediate mountains. Individual areas are irregular in shape and range from 10 to 80 acres in size.

The typical sequence, depth, and composition of the layers of the Cashiers soil are as follows—

Surface layer:
0 to 8 inches, dark brown gravelly fine sandy loam

Subsoil:
8 to 31 inches, yellowish brown fine sandy loam
31 to 49 inches, brownish yellow fine sandy loam

Underlying material:
49 to 60 inches, multicolored sandy loam

Permeability is moderately rapid. Surface runoff is slow in areas where undisturbed forest litter is on the surface and very rapid in areas without forest litter. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is high or very high. The underlying material has a very high content of mica. It cannot be easily stabilized, compacted, or vegetated and is extremely erodible.

Included in mapping are small areas of Chandler, Cullasaja, Fannin, and Tuckasegee soils. Chandler and Fannin soils have a surface layer that is thinner or lighter in color than that of the Cashiers soil. Also, Fannin soils have more clay in the subsoil. Cullasaja soils have more than 35 percent rock fragments in the subsoil. Cullasaja and Tuckasegee soils contain less mica than the Cashiers soil and are in drainageways. Chandler and Fannin soils are on south- to west-facing slopes. Also included are small areas of rock outcrop. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Cashiers soil but have a redder subsoil or a dark surface layer that is more than 10 inches thick.

Nearly all of the acreage in this map unit is used as woodland.

This map unit is poorly suited to timber production because of the slope. The hazard of erosion and an equipment limitation are severe management concerns. The instability of the underlying material also is a management concern. This unit is desirable for timber production, however, because of high productivity and valuable species. The most common trees are yellow-poplar, northern red oak, black cherry, sweet birch, and sugar maple. Yellow-poplar is common at the lower elevations. Yellow birch, American beech, and eastern

hemlock are common at the upper elevations. Scarlet oak, white oak, black oak, and hickory are common on severely high-graded sites.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good and hardwood seedlings are available. Reforestation of hardwoods is dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

When the soil is wet, unsurfaced roads are highly erodible and very slick because of the high content of mica. The slope restricts the kinds of equipment that can be used. Operating wheeled or tracked equipment is dangerous because of the slope. Cable yarding is safer, disturbs the soil less, and maintains the productivity of the soil.

This map unit is poorly suited to recreational uses, such as hiking trails. The slope and the hazard of erosion are management concerns. The trails are very slick during rainy periods.

This map unit is not used for pasture, building site development, or crops. The slope and the hazard of erosion are the main management concerns.

This map unit is poorly suited to access roads because of the slope, frost action, and low strength. It is used for this purpose, however, because timber production is a use. The hazard of erosion, the instability of the underlying material, and difficulty in compacting the soil also are management concerns. Access roads are difficult and expensive to build and maintain. Because unvegetated and unsurfaced roadbeds are slick when wet and are easily eroded, surfacing and continuous maintenance are required for year-round use. Building the roadbed on natural soil minimizes slumping. Compacting the underlying material for use in roadbeds is very difficult. Placing a slight tilt in the roadbed so that water flows off the downhill side is a better way to remove water than ditches, which are impractical because banks slump. This soil requires more culverts, broad-based dips, and water bars to control water than soils that have a lower content of mica. These measures allow water to be diverted to outlets more often and in smaller amounts. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating and maintaining large areas that have been cut and filled are difficult. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIIe. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 7R.

CcF—Cataska-Sylco complex, 50 to 95 percent slopes. This very steep map unit consists mainly of a shallow, excessively drained Cataska soil and a moderately deep, well drained Sylco soil. The unit is on mountainsides in the low and intermediate mountains. Individual areas range from 10 to 80 acres in size. Typically, they are 40 to 50 percent Cataska soil and 30 to 40 percent Sylco soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Cataska soil are as follows—

Surface layer:
0 to 6 inches, dark brown very channery loam

Subsoil:
6 to 16 inches, dark yellowish brown very channery loam

Weathered bedrock:
16 to 30 inches, multicolored slate

Hard bedrock:
30 inches, slate

The typical sequence, depth, and composition of the layers of the Sylco soil are as follows—

Surface layer:
0 to 6 inches, dark brown very channery loam

Subsoil:
6 to 22 inches, dark yellowish brown very channery loam

Weathered bedrock:
22 to 30 inches, multicolored slate

Hard bedrock:
30 inches, slate

Permeability is moderately rapid in the Cataska and Sylco soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to weathered

bedrock is 10 to 20 inches in the Cataska soil and 20 to 40 inches in the Sylco soil. The organic matter content in the surface layer ranges from low to high in the Sylco soil and from low to moderate in the Cataska soil. Mass movement occurs when the soil slides off the rock contact or the rock shears along planes of weakness during the wet season.

Included in mapping are small areas of Junaluska, Soco, and Spivey soils. Junaluska soils have more clay in the subsoil than the Cataska and Sylco soils, and Spivey soils have a thicker, darker surface layer. Junaluska and Soco soils have less than 35 percent rock fragments in the subsoil. They are on foot slopes. Spivey soils are in drainageways. Also included are small areas of rock outcrop. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some areas of soils that are similar to the Cataska and Sylco soils but have fewer rock fragments or a redder subsoil.

All of the acreage in this map unit is wooded. Some areas are used for recreational activities.

This map unit is poorly suited to woodland because of the slope. The hazard of erosion is a moderate management concern, and an equipment limitation is a severe management concern. Droughtiness also is a management concern. This unit is not used for commercial timber production because the productivity is very low and the soils are very steep. The most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, shortleaf pine, pitch pine, Virginia pine, and hickory.

This map unit is poorly suited to recreational uses because of the slope, but a few areas are used for hiking trails. Erosion is a hazard.

This map unit is not used for crops, pasture, or building site development. The slope, droughtiness, the depth to bedrock, and erosion are management concerns.

This map unit is poorly suited to access roads because of the slope. The depth to bedrock and the instability of the underlying bedrock also are management concerns. Some areas, however, are used for roads that access fire towers or wildlife fields. Access roads are difficult and expensive to build and maintain. Drilling and blasting of the hard bedrock are commonly needed. The underlying bedrock is susceptible to mass movement, especially during periods of heavy rainfall and high traffic. The orientation of the dip in the rock as it relates to the roadbed greatly affects the likelihood of mass movement occurring. Building the roadbed on natural soil minimizes slumping. Placing a slight tilt in the roadbed so that water flows off the downhill side is a better way to manage water than ditches, which are impractical because banks slump. Road construction results in large areas that have been cut and filled. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating disturbed areas is difficult because of the slope and slumping, especially on south- and west-facing slopes that freeze and thaw in spring and fall. Large amounts of ultra acid, sulfur-bearing rock may be exposed by road building. Water seeping through or flowing over this rock may enter nearby streams and kill aquatic life. Preventing damage to the aquatic life requires special treatment of the exposed areas. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIIs. Based on chestnut oak as the indicator species, the woodland ordination symbol is 2R in areas of the Cataska soil. Based on shortleaf pine as the indicator species, the woodland ordination symbol is 5R in areas of the Sylco soil.

CdD—Chandler gravelly fine sandy loam, 15 to 30 percent slopes. This map unit consists mainly of moderately steep, very deep, somewhat excessively drained Chandler and similar soils on side slopes and narrow ridgetops in the low and intermediate mountains. Individual areas range from 5 to 40 acres in size.

The typical sequence, depth, and composition of the layers of the Chandler soil are as follows—

Surface layer:
0 to 5 inches, dark brown gravelly fine sandy loam

Subsoil:
5 to 17 inches, yellowish brown loam
17 to 29 inches, brownish yellow sandy loam

Underlying material:
29 to 41 inches, brownish yellow sandy loam
41 to 60 inches, multicolored sandy loam

Permeability is moderately rapid. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to bedrock is more than 72 inches. The organic matter content in the surface layer ranges from low to high. The underlying material has a very high content of mica. It cannot be easily stabilized, compacted, or vegetated and is extremely erodible.

Included in mapping are small areas of Cashiers, Fannin, and Tuckasegee soils. Cashiers and Tuckasegee soils have a thicker, darker surface layer than that of the Chandler soil, and Fannin soils have more clay in the subsoil. Cashiers soils are on north- to east-facing head slopes. Fannin soils are on south- to west-facing slopes. Tuckasegee soils are in drainageways. Also included are small areas of rock

outcrop. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Chandler soil but have a redder subsoil or more stones.

Much of the acreage in this map unit is used as woodland. Other uses include pasture, specialty crops, and building site development. In the southern part of the county, high summer rainfall compensates for the droughtiness of the soil and increases productivity.

This map unit is only moderately suited to woodland because of the slope. The hazard of erosion and an equipment limitation are moderate management concerns. The instability of the underlying material also is a management concern. This soil produces a lower volume of timber and has fewer valuable species than highly productive soils, such as Cashiers soils. In areas of high rainfall, the most common trees are eastern white pine, yellow-poplar, white oak, and red maple. In other areas the most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, pitch pine, Virginia pine, and hickory. Windblown seeds from such species as yellow-poplar, black locust, pitch pine, Virginia pine, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good. Hardwood seedlings are favored on sites where the amount of annual rainfall is more than 60 inches. Reforestation of hardwoods is dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. It is favored where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

The use of heavy equipment should be restricted to dry periods. When the soil is wet, skid trails and unsurfaced roads are extremely erodible and very slick because of the high content of mica.

This map unit is only moderately suited to pasture because of the slope. The hazard of erosion also is a management concern. Operating farm equipment is difficult because of the slope. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Keeping the pasture in good condition helps to control erosion.

This map unit is poorly suited to specialty crops, such as landscaping plants and Christmas trees. The slope and the hazard of erosion are management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, and rhododendron. In the areas of high rainfall, Fraser fir is grown for use as Christmas trees. White pine is grown in other areas. Operating farm equipment is difficult because of the slope. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff.

This map unit is poorly suited to building site development because of the slope. The instability of the underlying material and the hazard of erosion also are management concerns. Caving of cutbanks is a hazard during excavation because of the very high content of mica in the underlying material. Revegetating and maintaining disturbed areas are difficult because of the slope, freezing and thawing, and erosion. Hydroseeding is a good way to revegetate steep cutbanks.

This map unit is only moderately suited to recreational uses, such as hiking trails. The slope and the hazard of erosion are management concerns. The trails are very slick during rainy periods. Freezing and thawing increase the need for trail maintenance on south- to west-facing slopes.

This map unit is not used for row crops. The slope and the hazard of erosion are management concerns.

This map unit is poorly suited to access roads because of the slope, frost action, and low strength. The hazard of erosion and difficulty in compacting the soil also are management concerns. This unit commonly is used for access roads, however, because timber production and building site development are important uses. Building the roadbed on natural soil minimizes slumping. Because unvegetated and unsurfaced roadbeds are very slick when wet and are easily eroded, surfacing and continuous maintenance are required for year-round use. Compacting the underlying material for use in roadbeds is very difficult. The underlying material is extremely erodible. Placing a slight tilt in the roadbed so that water flows off the downhill side is a better way to remove water than ditches, which are impractical because banks slump. This soil requires more culverts, broad-based dips, and water bars to control water than soils that have a lower content of mica. These measures allow water to be diverted to outlets more often and in smaller amounts. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating and maintaining areas that have been cut and filled are difficult, especially on south- to west-facing slopes that freeze and thaw in spring and fall.

Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIe. Based on chestnut oak as the indicator species, the woodland ordination symbol is 3R.

CdE—Chandler gravelly fine sandy loam, 30 to 50 percent slopes. This map unit consists mainly of steep, very deep, somewhat excessively drained Chandler and similar soils on side slopes and narrow ridgetops in the low and intermediate mountains. Individual areas range from 5 to 60 acres in size.

The typical sequence, depth, and composition of the layers of the Chandler soil are as follows—

Surface layer:
0 to 5 inches, dark brown gravelly fine sandy loam

Subsoil:
5 to 17 inches, yellowish brown loam
17 to 29 inches, brownish yellow sandy loam

Underlying material:
29 to 41 inches, brownish yellow sandy loam
41 to 60 inches, multicolored sandy loam

Permeability is moderately rapid. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to bedrock is more than 72 inches. The organic matter content in the surface layer ranges from low to high. The underlying material has a very high content of mica. It cannot be easily stabilized, compacted, or vegetated and is extremely erodible.

Included in mapping are small areas of Cashiers, Cullasaja, Fannin, and Tuckasegee soils. Cashiers, Cullasaja, and Tuckasegee soils have a thicker, darker surface layer than that of the Chandler soil, and Fannin soils have more clay in the subsoil. Cullasaja soils have more than 35 percent rock fragments in the subsoil. Cashiers soils are on north- to east-facing slopes. Fannin soils are on south- to west-facing slopes. Cullasaja and Tuckasegee soils are in drainageways. Also included are small areas of rock outcrop. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Chandler soil but have a redder subsoil or more stones.

Much of the acreage in this map unit is used as woodland. Other uses include pasture, specialty crops, and building site development. In the southern part of the county, high summer rainfall compensates for the droughtiness of the soil and increases productivity.

This map unit is poorly suited to timber production because of the slope. The hazard of erosion and an equipment limitation are severe management concerns. The instability of the underlying material also is a management concern. This soil produces a lower volume of timber and has fewer valuable species than highly productive soils, such as Cashiers soils. In areas of high rainfall, the most common trees are eastern white pine, yellow-poplar, white oak, and red maple. In other areas the most common trees are scarlet oak, chestnut oak, black oak, pitch pine, Virginia pine, and hickory. Windblown seeds from such species as yellow-poplar, black locust, pitch pine, Virginia pine, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good. Hardwood seedlings are favored on sites where the amount of annual rainfall is more than 60 inches. Reforestation of hardwoods is dominantly through sprouting in cutover stands. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. It is favored where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

The use of heavy equipment should be restricted to dry periods or to periods when the ground is frozen. When the soil is wet, skid trails and unsurfaced roads are extremely erodible and very slick because of the high content of mica.

This map unit is poorly suited to pasture because of the slope. The hazard of erosion also is a management concern. Operating farm equipment is dangerous because of the slope. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Generally, weeds are controlled and fertilizer and lime are applied by hand. Keeping the pasture in good condition helps to control erosion.

This map unit is poorly suited to specialty crops, such as landscaping plants and Christmas trees, but some areas of high rainfall are used for these crops. The slope and the hazard of erosion are the main management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, and rhododendron. Fraser fir is grown for use as

Christmas trees. Operating farm equipment is dangerous because of the slope. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff.

This map unit is poorly suited to building site development because of the slope. The instability of the underlying material and the hazard of erosion also are management concerns. Septic tank absorption fields should be dug by hand because of the slope. Caving of cutbanks is a hazard during excavation because of the very high content of mica in the underlying material. Revegetating and maintaining disturbed areas are difficult because of the slope, freezing and thawing, and erosion. Hydroseeding is a good way to revegetate steep cutbanks.

This map unit is poorly suited to recreational uses, such as hiking trails. The slope and the hazard of erosion are management concerns. The trails are very slick during rainy periods. Freezing and thawing increase the need for trail maintenance on south- to west-facing slopes.

This map unit is not used for row crops. The slope and the hazard of erosion are management concerns.

This map unit is poorly suited to access roads because of the slope, frost action, and low strength. The hazard of erosion and difficulty in compacting the soil also are management concerns. This unit commonly is used for access roads, however, because timber production and building site development are important uses. Because unvegetated and unsurfaced roadbeds are slick when wet and are easily eroded, surfacing and continuous maintenance are required for year-round use. Building the roadbed on natural soil minimizes slumping. Compacting the underlying material for use in roadbeds is very difficult. The underlying material is extremely erodible. Placing a slight tilt in the roadbed so that water flows off the downhill side is a better way to remove water than ditches, which are impractical because banks slump. This soil requires more culverts, broad-based dips, and water bars to control water than soils that have a lower content of mica. These measures allow water to be diverted to outlets more often and in smaller amounts. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating and maintaining large areas that have been cut and filled are difficult, especially on south- to west-facing slopes that freeze and thaw in spring and fall. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIIe. Based on chestnut oak as the indicator species, the woodland ordination symbol is 3R.

CdF—Chandler gravelly fine sandy loam, 50 to 95 percent slopes. This map unit consists mainly of very steep, very deep, somewhat excessively drained Chandler and similar soils on side slopes in the low and intermediate mountains. Individual areas range from 10 to 80 acres in size.

The typical sequence, depth, and composition of the layers of the Chandler soil are as follows—

Surface layer:
0 to 5 inches, dark brown gravelly fine sandy loam

Subsoil:
5 to 17 inches, yellowish brown loam
17 to 29 inches, brownish yellow sandy loam

Underlying material:
29 to 41 inches, brownish yellow sandy loam
41 to 60 inches, multicolored sandy loam

Permeability is moderately rapid. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to bedrock is more than 72 inches. The organic matter content in the surface layer ranges from low to high. The underlying material has a very high content of mica. It cannot be easily stabilized, compacted, or vegetated and is extremely erodible.

Included in mapping are small areas of Cashiers, Cullasaja, Fannin, and Tuckasegee soils. Cashiers, Cullasaja, and Tuckasegee soils have a thicker, darker surface layer than that of the Chandler soil, and Fannin soils have more clay in the subsoil. Cullasaja soils have more than 35 percent rock fragments in the subsoil. Cashiers soils are on north- to east-facing head slopes. Fannin soils are on south- to west-facing slopes. Cullasaja and Tuckasegee soils are in drainageways. Also included are small areas of rock outcrop. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Chandler soil but have a redder subsoil or more stones.

Nearly all of the acreage in this map unit is used as woodland. In the southern part of the county, high summer rainfall compensates for the droughtiness of the soil and increases productivity.

This map unit is poorly suited to timber production because of the slope. The hazard of erosion and an equipment limitation are severe management concerns. The instability of the underlying material also is a management concern. This soil produces a lower volume of timber and has fewer valuable species than highly productive soils, such as Cashiers soils. In areas of high rainfall, the most common trees are eastern white pine, yellow-poplar, white oak, and red maple. In

other areas the most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, pitch pine, Virginia pine, and hickory.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good. Hardwood seedlings are favored on sites where the amount of annual rainfall is more than 60 inches. Reforestation of hardwoods is dominantly through sprouting. Cutting all trees and large shrubs increases the number and quality of the sprouts.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. It is favored where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

When the soil is wet, unsurfaced roads are extremely erodible and very slick because of the very high content of mica. The slope restricts the kinds of equipment that can be used. Operating wheeled or tracked equipment is dangerous because of the slope. Cable yarding is safer, disturbs the soil less, and maintains the productivity of the soil.

This map unit is poorly suited to recreational uses, such as hiking trails. The slope and the hazard of erosion are management concerns. The trails are very slick during rainy periods. Freezing and thawing increase the need for trail maintenance on south- to west-facing slopes.

This map unit is not used for pasture, building site development, or crops. The slope and the hazard of erosion are the main management concerns.

This map unit is poorly suited to access roads because of the slope. It is used for this purpose, however, because timber production is a use. The hazard of erosion and difficulty in compacting the soil also are management concerns. Building and maintaining access roads are difficult and expensive. Because unvegetated and unsurfaced roadbeds are slick when wet and are easily eroded, surfacing and continuous maintenance are required for year-round use. Building the roadbed on natural soil minimizes slumping. Compacting the underlying material for use in roadbeds is very difficult. The underlying material is extremely erodible. Placing a slight tilt in the roadbed so that water flows off the downhill side is a better way to manage water than ditches, which are impractical because banks slump. This soil requires more culverts, broad-based dips, and water bars to control water than soils that have a lower content of mica. These measures allow water to be diverted to outlets more often and in smaller amounts. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating and maintaining large areas that have been cut and filled are difficult because of the slope and slumping. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIIe. Based on chestnut oak as the indicator species, the woodland ordination symbol is 3R.

ChE—Cheoah channery loam, 30 to 50 percent slopes. This map unit consists mainly of steep, deep, well drained Cheoah and similar soils on north- to east-facing head slopes and side slopes in the low and intermediate mountains. Individual areas are irregular in shape and range from 5 to 80 acres in size.

The typical sequence, depth, and composition of the layers of the Cheoah soil are as follows—

Surface layer:

0 to 3 inches, very dark brown channery loam
3 to 12 inches, dark brown channery fine sandy loam
12 to 17 inches, dark yellowish brown channery fine sandy loam

Subsoil:

17 to 36 inches, yellowish brown fine sandy loam
36 to 47 inches, yellowish brown channery fine sandy loam

Weathered bedrock:

47 to 60 inches, multicolored metasandstone and phyllite

Permeability is moderately rapid. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to weathered bedrock is 40 to 60 inches. The organic matter content in the surface layer is high or very high. Landslides occur on this soil.

Included in mapping are small areas of Santeetlah, Soco, Spivey, and Stecoah soils. Santeetlah soils are very deep. Soco and Stecoah soils have a surface layer that is thinner or lighter in color than that of the Cheoah soil. Soco soils are moderately deep over weathered bedrock. Spivey soils have more than 35 percent rock fragments in the subsoil. Soco and Stecoah soils are on south- to west-facing slopes. Spivey and Santeetlah soils are in drainageways. Also included near ridges are small areas of rock outcrop and seeps. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are

similar to the Cheoah soil but have a dark surface layer that is less than 10 or more than 20 inches thick. Where the surface layer is less than 10 inches thick, the soils are on nose slopes or shoulder slopes. Where the surface layer is more than 20 inches thick, the soils are in saddles or on foot slopes.

Much of the acreage in this map unit is used as woodland. Other uses include building site development and recreational activities.

This map unit is poorly suited to woodland because of the slope. The hazard of erosion and an equipment limitation are severe management concerns. This unit is desirable for timber production, however, because of high productivity and valuable species. It commonly is used for this purpose on National Forest lands. Privately owned areas are rarely used for timber production because of a high potential value for building site development. The most common trees are yellow-poplar, northern red oak, black cherry, sweet birch, and sugar maple. Yellow-poplar is common at the lower elevations. Yellow birch, American beech, and eastern hemlock are common at the upper elevations. Scarlet oak, white oak, black oak, and hickory are common on severely high-graded sites. Windblown seeds from such species as yellow-poplar, black locust, sugar maple, eastern hemlock, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production. Reforestation of hardwoods is dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

Care is needed to prevent soil compaction. The use of wheeled and tracked equipment is difficult because of the slope. The use of heavy equipment should be restricted to dry periods or to periods when the ground is frozen. When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick because of the organic matter content.

This map unit is poorly suited to building site development because of the slope. The hazard of erosion also is a management concern. Because of cold winter temperatures, building sites are used mainly for summer homes. Septic tank absorption fields should be dug by hand because of the slope. Revegetating disturbed areas is difficult because of the slope. Hydroseeding is a good way to revegetate steep cutbanks.

This map unit is poorly suited to recreational uses, such as hiking trails. The slope and the hazard of erosion are management concerns. The trails are slick during rainy periods.

This map unit is not used for crops or pasture. The slope and the hazard of erosion are management concerns.

This map unit is poorly suited to access roads because of the slope. It commonly is used for this purpose, however, because timber production and building site development are important uses. The instability of the underlying bedrock and the hazard of erosion are management concerns. Building the roadbed on natural soil minimizes slumping. The underlying bedrock is susceptible to mass movement, especially during periods of heavy rainfall and high traffic. The orientation of the dip in the rock as it relates to the roadbed greatly affects the likelihood of mass movement occurring. Placing a slight tilt in the roadbed so that water flows off the downhill side is a better way to remove water than ditches, which are impractical because banks slump. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating areas that have been cut and filled is difficult because of the slope and slumping. Hydroseeding is a good way to revegetate steep roadbanks. Large amounts of ultra acid, sulfur-bearing rock may be exposed by road building. Water seeping through or flowing over this rock may enter nearby streams and kill aquatic life. A plant cover is required to control freezing and thawing of fill material. Lime and fertilizer are required to establish and maintain vegetation.

The capability subclass is VIIe. Based on northern red oak as the indicator species, the woodland ordination symbol is 4R.

ChF—Cheoah channery loam, 50 to 95 percent slopes. This map unit consists mainly of very steep, deep, well drained Cheoah and similar soils on north- to east-facing head slopes and side slopes in the low and intermediate mountains. Individual areas are irregular in shape and range from 10 to 150 acres in size.

The typical sequence, depth, and composition of the layers of the Cheoah soil are as follows—

Surface layer:

0 to 3 inches, very dark brown channery loam

3 to 12 inches, dark brown channery fine sandy loam

12 to 17 inches, dark yellowish brown channery fine sandy loam

Subsoil:

17 to 36 inches, yellowish brown fine sandy loam

36 to 47 inches, yellowish brown channery fine sandy loam

Weathered bedrock:

47 to 60 inches, multicolored metasandstone and phyllite

Permeability is moderately rapid. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to weathered bedrock is 40 to 60 inches. The organic matter content in the surface layer is high or very high. Landslides occur on this soil.

Included in mapping are small areas of Santeetlah, Soco, Spivey, and Stecoah soils. Santeetlah soils are very deep. Soco and Stecoah soils have a surface layer that is thinner or lighter in color than that of the Cheoah soil. Soco soils are moderately deep over weathered bedrock. Spivey soils have more than 35 percent rock fragments in the subsoil. Soco and Stecoah soils are on south- to west-facing slopes. Spivey and Santeetlah soils formed in colluvium and are in drainageways. Also included near ridges are small areas of rock outcrop and seeps. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Cheoah soil but have a dark surface layer that is less than 10 or more than 20 inches thick. Where the surface layer is less than 10 inches thick, the soils are on nose slopes or shoulder slopes. Where the surface layer is more than 20 inches thick, the soils are in saddles or on foot slopes.

Nearly all of the acreage in this map unit is used as woodland. Some areas are used for recreational activities.

This map unit is poorly suited to woodland because of the slope. The hazard of erosion and an equipment limitation are severe management concerns. This unit is desirable for timber production, however, because of high productivity and valuable species. It commonly is used for this purpose on National Forest lands. Privately owned areas are rarely used for timber production because of a high potential value for building site development. The most common trees are yellow-poplar, northern red oak, black cherry, sweet birch, and sugar maple. Yellow-poplar is common at the lower elevations. Yellow birch, American beech, and eastern hemlock are common at the upper elevations. Scarlet oak, white oak, black oak, and hickory are common on severely high-graded sites.

Hardwoods are preferred for timber production. Reforestation of hardwoods occurs dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

When the soil is wet, unsurfaced roads are highly erodible and very slick because of the organic matter content. The slope restricts the kinds of equipment that can be used. Operating wheeled or tracked equipment is dangerous because of the slope. Cable yarding is safer, disturbs the soil less, and maintains the productivity of the soil.

This map unit is poorly suited to recreational uses, such as hiking trails. The slope and the hazard of erosion are management concerns. The trails are very slick during rainy periods.

This map unit is not used for pasture, building site development, or crops. The slope and the hazard of erosion are the main management concerns.

This map unit is poorly suited to access roads because of the slope. It is used for this purpose, however, because timber production is a use. The instability of the underlying bedrock and the hazard of erosion are management concerns. Access roads are difficult and expensive to build and maintain. Building the roadbed on natural soil minimizes slumping. The underlying bedrock is susceptible to mass movement, especially during periods of heavy rainfall and high traffic. The orientation of the dip in the rock as it relates to the roadbed greatly affects the likelihood of mass movement occurring. Placing a slight tilt in the roadbed so that water flows off the downhill side is a better way to remove water than ditches, which are impractical because banks slump. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating areas that have been cut and filled is difficult because of the slope and slumping. Hydroseeding is a good way to revegetate steep roadbanks. Large amounts of ultra acid, sulfur-bearing rock may be exposed by road building. Water seeping through or flowing over this rock may enter nearby streams and kill aquatic life. A plant cover is required to control freezing and thawing of fill material. Lime and fertilizer are required to establish and maintain vegetation.

The capability subclass is VIIe. Based on northern red oak as the indicator species, the woodland ordination symbol is 4R.

CnC—Chestnut-Edneyville complex, windswept, 8 to 15 percent slopes, stony. This strongly sloping map unit consists mainly of a moderately deep, well drained Chestnut soil and a very deep, well drained Edneyville soil. The unit is on moderately broad ridgetops in the intermediate mountains. Scattered stones and boulders are on the surface. Individual areas are long and narrow and range from 5 to 40 acres in size. Typically, they are 40 to 50 percent Chestnut soil and 30 to 40 percent Edneyville soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Chestnut soil are as follows—

Surface layer:
0 to 5 inches, dark brown gravelly fine sandy loam
5 to 10 inches, dark yellowish brown gravelly fine sandy loam

Subsoil:
10 to 24 inches, dark yellowish brown gravelly fine sandy loam

Underlying material:
24 to 36 inches, multicolored cobbly fine sandy loam

Weathered bedrock:
36 to 45 inches, multicolored gneiss

The typical sequence, depth, and composition of the layers of the Edneyville soil are as follows—

Surface layer:
0 to 5 inches, dark yellowish brown fine sandy loam

Subsoil:
5 to 12 inches, strong brown loam
12 to 39 inches, strong brown fine sandy loam
39 to 43 inches, mottled yellowish brown, strong brown, and light yellowish brown fine sandy loam

Underlying material:
43 to 51 inches, mottled yellowish brown, yellowish red, and very pale brown sandy loam
51 to 64 inches, gray, black, and white sandy loam

Permeability is moderately rapid in the Chestnut and Edneyville soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and medium in areas without forest litter. The depth to weathered bedrock is 20 to 40 inches in the Chestnut soil and more than 60 inches in the Edneyville soil. The organic matter content in the surface layer ranges from low to high.

Included in mapping are small areas of Cleveland, Cowee, Evard, and Plott soils. Cleveland soils are shallow over hard bedrock. Cowee and Evard soils have more clay in the subsoil than the Chestnut and Edneyville soils, and Plott soils have a thicker, darker surface layer. Cleveland soils are around small areas of rock outcrop. Cowee and Evard soils are on south- to west-facing slopes. Plott soils are in saddles. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Chestnut and Edneyville soils but have a redder subsoil or fewer stones on the surface.

Much of the acreage in this map unit is wooded. Some areas are used for building site development, recreational activities, or pasture.

This map unit is poorly suited to woodland because of the severe climatic conditions, which cause low productivity. The unit is not used for commercial timber production. Trees are stunted, twisted, or otherwise damaged by wind and ice. The most common trees are scarlet oak, chestnut oak, eastern white pine, pitch pine, Virginia pine, hickory, and northern red oak.

This map unit is only moderately suited to building site development because of the slope and the depth to bedrock. Stones and the hazard of erosion also are management concerns. Because of cold winter temperatures and high winds, building sites are used mainly for summer homes. Excavation for dwellings with basements may be hampered by the depth to bedrock in the Chestnut soil. In some areas the Chestnut soil is too shallow to be used as a site for septic tank absorption fields. This map unit is in areas where the amount of annual rainfall exceeds 70 inches. Revegetating building sites as soon as possible helps to control erosion in these areas.

This map unit is only moderately suited to recreational uses, such as overlooks, hiking trails, and camp sites. Freezing and thawing increase the need for trail maintenance on south- to west-facing slopes. Water sources, such as springs, are not generally available in areas of this map unit.

This map unit is well suited to pasture. Stones and the hazard of erosion are management concerns. Accessing some areas is difficult because of the surrounding steep terrain. Most of the large stones are removed when sod is established. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Keeping the pasture in good condition can help to control erosion. Cool season grasses, such as tall fescue and orchardgrass, can provide late season pasture.

This map unit is not used for crops because of difficult access. The slope, stones, and the hazard of erosion are management concerns.

This map unit is only moderately suited to access roads because of the slope and frost action. It commonly is used for this purpose because building site development is an important use. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating areas that have been cut and filled is difficult, especially on south- to west-facing slopes that freeze and thaw in spring and fall.

The capability subclass is IVe. Based on northern red oak as the indicator species, the woodland ordination symbol is 2D in areas of the Chestnut soil and 2A in areas of the Edneyville soil.

CnD—Chestnut-Edneyville complex, windswept, 15 to 30 percent slopes, stony. This moderately steep map unit consists mainly of a moderately deep, well drained Chestnut soil and a very deep, well drained Edneyville soil. The unit is on moderately broad ridgetops in the intermediate mountains. Scattered stones and boulders are on the surface. Individual areas are long and narrow and range from 5 to 60 acres in size. Typically, they are 40 to 50 percent Chestnut soil and 30 to 40 percent Edneyville soil. The two soils occur as areas too intricately mixed and too small to be mapped separately.

The typical sequence, depth, and composition of the layers of the Chestnut soil are as follows—

Surface layer:
- 0 to 5 inches, dark brown gravelly fine sandy loam
- 5 to 10 inches, dark yellowish brown gravelly fine sandy loam

Subsoil:
- 10 to 24 inches, dark yellowish brown gravelly fine sandy loam

Underlying material:
- 24 to 36 inches, multicolored cobbly fine sandy loam

Weathered bedrock:
- 36 to 45 inches, multicolored gneiss

The typical sequence, depth, and composition of the layers of the Edneyville soil are as follows—

Surface layer:
- 0 to 5 inches, dark yellowish brown fine sandy loam

Subsoil:
- 5 to 12 inches, strong brown loam
- 12 to 39 inches, strong brown fine sandy loam
- 39 to 43 inches, mottled yellowish brown, strong brown, and light yellowish brown fine sandy loam

Underlying material:
- 43 to 51 inches, mottled yellowish brown, yellowish red, and very pale brown sandy loam
- 51 to 64 inches, gray, black, and white sandy loam

Permeability is moderately rapid in the Chestnut and Edneyville soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to weathered bedrock is 20 to 40 inches in the Chestnut soil and more than 60 inches in the Edneyville soil. The organic matter content in the surface layer ranges from low to high.

Included in mapping are small areas of Cleveland, Cowee, Evard, and Plott soils. Cleveland soils are shallow over hard bedrock. Cowee and Evard soils have more clay in the subsoil than the Chestnut and Edneyville soils, and Plott soils have a thicker, darker surface layer. Cleveland soils are around small areas of rock outcrop. Cowee and Evard soils are on south- to west-facing slopes. Plott soils are in saddles or on the lower part of side slopes. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Chestnut and Edneyville soils but have a redder subsoil or fewer stones on the surface.

Much of the acreage in this map unit is wooded. Some areas are used for building site development, recreational activities, or pasture.

This map unit is poorly suited to woodland because of the severe climatic conditions, which cause low productivity. The unit is not used for commercial timber production. Trees are stunted, twisted, or otherwise damaged by wind and ice. The most common trees are scarlet oak, chestnut oak, black oak, eastern white pine, pitch pine, Virginia pine, hickory, and northern red oak.

This map unit is poorly suited to building site development because of the slope and the depth to bedrock. Stones and the hazard of erosion also are management concerns. Because of cold winter temperatures and high winds, building sites are used mainly for summer homes. Revegetating disturbed areas is difficult because of the slope and freezing and thawing. Excavation for dwellings with basements may be hampered by the depth to bedrock in the Chestnut soil. In some areas the Chestnut soil is too shallow to be used as a site for septic tank absorption fields. This map unit is in areas where the amount of annual rainfall exceeds 70 inches. Revegetating building sites as soon as possible helps to control erosion in these areas.

This map unit is only moderately suited to recreational uses, such as overlooks and hiking trails. The slope is the main management concern. Freezing and thawing increase the need for trail maintenance on south- to west-facing slopes.

This map unit is only moderately suited to pasture because of the slope. Stones and the hazard of erosion also are management concerns. Accessing some areas may be difficult because of the surrounding steep terrain. Most of the large stones are removed when sod is established. Operating farm equipment is difficult because of the slope. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Keeping the pasture in good condition can help to control erosion. Cool season grasses, such as tall fescue and orchardgrass, can provide late season pasture.

This map unit is not used for crops. The slope, stones, and the hazard of erosion are management concerns.

This map unit is poorly suited to access roads because of the slope. Freezing and thawing of the surface, stones, and the hazard of erosion also are management concerns. This unit is used for access roads, however, because building site development is an important use. Building the roadbed on natural soil minimizes slumping. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating areas that have been cut and filled is difficult, especially on south- to west-facing slopes that freeze and thaw in spring and fall. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIe. Based on northern red oak as the indicator species, the woodland ordination symbol is 2R.

CnE—Chestnut-Edneyville complex, windswept, 30 to 50 percent slopes, stony. This steep map unit consists mainly of a moderately deep, well drained Chestnut soil and a very deep, well drained Edneyville soil. The unit is on mountainsides and ridgetops in the intermediate mountains. Scattered stones and boulders are on the surface. Individual areas range from 10 to 80 acres in size. Typically, they are 40 to 50 percent Chestnut soil and 30 to 40 percent Edneyville soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Chestnut soil are as follows—

Surface layer:

0 to 5 inches, dark brown gravelly fine sandy loam

5 to 10 inches, dark yellowish brown gravelly fine sandy loam

Subsoil:

10 to 24 inches, dark yellowish brown gravelly fine sandy loam

Underlying material:

24 to 36 inches, multicolored cobbly fine sandy loam

Weathered bedrock:

36 to 45 inches, multicolored gneiss

The typical sequence, depth, and composition of the layers of the Edneyville soil are as follows—

Surface layer:

0 to 5 inches, dark yellowish brown fine sandy loam

Subsoil:

5 to 12 inches, strong brown loam

12 to 39 inches, strong brown fine sandy loam

39 to 43 inches, mottled yellowish brown, strong brown, and light yellowish brown fine sandy loam

Underlying material:

43 to 51 inches, mottled yellowish brown, yellowish red, and very pale brown sandy loam

51 to 64 inches, gray, black, and white sandy loam

Permeability is moderately rapid in the Chestnut and Edneyville soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to weathered bedrock is 20 to 40 inches in the Chestnut soil and more than 60 inches in the Edneyville soil. The organic matter content in the surface layer ranges from low to high.

Included in mapping are small areas of Cleveland, Cowee, Cullasaja, Evard, and Plott soils. Cleveland soils are shallow over hard bedrock. Cowee and Evard soils have more clay in the subsoil than the Chestnut and Edneyville soils, and Cullasaja and Plott soils have a thicker, darker surface layer. Cullasaja soils have more than 35 percent rock fragments in the subsoil. Cleveland soils are around small areas of rock outcrop. Cowee and Evard soils are on south- to west-facing slopes. Cullasaja soils are in drainageways. Plott soils are on north- to east-facing spur ridges and head slopes. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Chestnut and Edneyville soils but have a redder subsoil or fewer stones on the surface.

Much of the acreage in this map unit is wooded. Other uses include pasture, recreational activities, and building site development.

This map unit is poorly suited to woodland because of the slope and climatic conditions, which cause low productivity. The unit is not used for commercial timber production. Trees are stunted, twisted, or otherwise damaged by wind and ice. The most common trees are scarlet oak, chestnut oak, black oak, eastern white pine, pitch pine, Virginia pine, hickory, and northern red oak.

This map unit is poorly suited to pasture because of the slope. Stones and the hazard of erosion also are management concerns. Most of the large stones are removed when sod is established. Operating farm equipment is dangerous because of the slope. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Generally, weeds are controlled and fertilizer and lime are applied by hand. Keeping the pasture in good condition can help to control erosion. Cool season grasses, such as tall fescue and orchardgrass, can provide late season pasture.

This map unit is poorly suited to recreational uses,

such as hiking trails and overlooks. The slope and the hazard of erosion are management concerns.

This map unit is poorly suited to building site development because of the slope and the depth to bedrock. Stones and the hazard of erosion also are management concerns. Because of cold winter temperatures and high winds, building sites are used mainly for summer homes. Revegetating disturbed areas is difficult and expensive, mainly because of the slope. Hydroseeding is a good way to revegetate steep cutbanks. Excavation for dwellings with basements may be hampered by the depth to bedrock in the Chestnut soil. Septic tank absorption fields should be dug by hand because of the slope. In some areas the Chestnut soil is too shallow to be used as a site for septic tank absorption fields. This map unit is in areas where the amount of annual rainfall exceeds 70 inches. Revegetating building sites as soon as possible helps to control erosion in these areas.

This map unit is not used for crops. The slope is the main management concern. Stones and the hazard of erosion also are management concerns.

This map unit is poorly suited to access roads because of the slope. It is used for this purpose, however, because building site development is an important use. Freezing and thawing are management concerns. Access roads are difficult and expensive to build and maintain. Because unvegetated and unsurfaced roadbeds are easily eroded, surfacing and continuous maintenance are required for year-round use. Building the roadbed on natural soil minimizes slumping. Where banks are long and steep, placing a slight tilt in the roadbed so that water flows off the downhill side is a better way to remove water than ditches, which are impractical because of slumping. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating large areas that have been cut and filled is difficult, especially on south- to west-facing slopes that freeze and thaw in spring and fall. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIIe. Based on northern red oak as the indicator species, the woodland ordination symbol is 2R.

CpD—Cleveland-Chestnut-Rock outcrop complex, windswept, 15 to 30 percent slopes. This moderately steep map unit occurs mainly as areas of a shallow, somewhat excessively drained Cleveland soil; a moderately deep, well drained Chestnut soil; and Rock outcrop. The unit is on moderately broad ridgetops in the intermediate mountains. Scattered stones and boulders are on the surface. Individual areas range from 10 to 40 acres in size. Typically, they are 30 to 40 percent Cleveland soil, 30 to 40 percent Chestnut soil, and 10 to 20 percent Rock outcrop. The two soils and Rock outcrop occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Cleveland soil are as follows—

Surface layer:
0 to 5 inches, black sandy loam

Subsoil:
5 to 9 inches, dark yellowish brown loam
9 to 17 inches, yellowish brown loam

Hard bedrock:
17 inches, granite

The typical sequence, depth, and composition of the layers of the Chestnut soil are as follows—

Surface layer:
0 to 5 inches, dark brown gravelly fine sandy loam
5 to 10 inches, dark yellowish brown gravelly fine sandy loam

Subsoil:
10 to 24 inches, dark yellowish brown gravelly fine sandy loam

Underlying material:
24 to 36 inches, multicolored cobbly fine sandy loam

Weathered bedrock:
36 to 45 inches, multicolored gneiss

Permeability is moderately rapid in the Cleveland and Chestnut soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid or very rapid in areas without litter. The depth to hard bedrock is 10 to 20 inches in the Cleveland soil. The depth to weathered bedrock is 20 to 40 inches in the Chestnut soil. The organic matter content in the surface layer of both soils ranges from low to high. Mass movement occurs when the soils slide off the rock contact during the wet season.

Included in mapping are small areas of Edneyville soils. These soils are very deep and are commonly in saddles. They make up about 15 percent of this map unit.

Also included in mapping are some soils that are similar to the Cleveland and Chestnut soils but have a redder subsoil or fewer stones on the surface.

Much of the acreage in this map unit is wooded. Some areas are used for building site development, pasture, or recreational activities.

This map unit is poorly suited to woodland because of the severe climatic conditions, which cause low

productivity. The unit is not used for commercial timber production. Trees are stunted, twisted, or otherwise damaged by wind and ice. Stones, the depth to bedrock, numerous areas of Rock outcrop, and the hazard of erosion also are management concerns. The most common trees are scarlet oak, chestnut oak, eastern white pine, pitch pine, Virginia pine, hickory, and northern red oak.

This map unit is poorly suited to building site development because of the slope and the depth to bedrock. Stones, numerous areas of Rock outcrop, and the hazard of erosion also are management concerns. Because of cold winter temperatures and high winds, building sites are used mainly for summer homes. Excavation for dwellings with basements is hampered by the depth to bedrock. Because the hazard of ground-water contamination or stream pollution is severe in areas of the shallow Cleveland soil, it should not be used as a site for septic tank absorption fields. This map unit is in areas where the amount of annual rainfall exceeds 70 inches. Revegetating building sites as soon as possible helps to control erosion in these areas.

This map unit is poorly suited to pasture because of the slope and the depth to bedrock. Stones, numerous areas of Rock outcrop, and the hazard of erosion also are management concerns. Most of the large stones are removed when sod is established. Operating farm equipment is difficult because of the slope. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Keeping the pasture in good condition can help to control erosion.

This map unit is only moderately suited to recreational uses, such as overlooks and hiking trails. The slope, the depth to bedrock, and the hazard of erosion are management concerns. Freezing and thawing increase the need for trail maintenance.

This map unit is not used for crops. The slope, stones, the depth to bedrock, numerous areas of Rock outcrop, and the hazard of erosion are management concerns.

This map unit is poorly suited to access roads because of the depth to bedrock and the slope. Numerous areas of Rock outcrop and the hazard of erosion also are management concerns. This unit is used for access roads, however, because building site development is an important use. Building and maintaining the roads are difficult and expensive. Because of a scarcity of soil material, grading the roadbeds is very difficult. Drilling and blasting of the hard bedrock are commonly needed. Building the roadbed on natural soil minimizes slumping. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality.

The capability subclass is VIIe in areas of the Cleveland soil, VIe in areas of the Chestnut soil, and VIIIs in areas of the Rock outcrop. Based on northern red oak as the indicator species, the woodland ordination symbol is 2D in areas of the Cleveland soil and 2R in areas of the Chestnut soil. The Rock outcrop has not been assigned a woodland ordination symbol.

CpE—Cleveland-Chestnut-Rock outcrop complex, windswept, 30 to 50 percent slopes. This steep map unit occurs mainly as areas of a shallow, somewhat excessively drained Cleveland soil; a moderately deep, well drained Chestnut soil; and Rock outcrop. The unit is on head slopes and moderately broad ridgetops in the intermediate mountains. Scattered stones and boulders are on the surface. Individual areas range from 10 to 80 acres in size. Typically, they are 35 to 45 percent Cleveland soil, 25 to 35 percent Chestnut soil, and 10 to 20 percent Rock outcrop. The two soils and Rock outcrop occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Cleveland soil are as follows—

Surface layer:
0 to 5 inches, black sandy loam

Subsoil:
5 to 9 inches, dark yellowish brown loam
9 to 17 inches, yellowish brown loam

Hard bedrock:
17 inches, granite

The typical sequence, depth, and composition of the layers of the Chestnut soil are as follows—

Surface layer:
0 to 5 inches, dark brown gravelly fine sandy loam
5 to 10 inches, dark yellowish brown gravelly fine sandy loam

Subsoil:
10 to 24 inches, dark yellowish brown gravelly fine sandy loam

Underlying material:
24 to 36 inches, multicolored cobbly fine sandy loam

Weathered bedrock:
36 to 45 inches, multicolored gneiss

Permeability is moderately rapid in the Cleveland and Chestnut soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid or very rapid in areas without forest litter. The depth to hard bedrock is 10 to 20 inches in the Cleveland soil.

The depth to weathered bedrock is 20 to 40 inches in the Chestnut soil. The organic matter content in the surface layer of both soils ranges from low to high. Mass movement occurs when the soils slide off the rock contact during the wet season.

Included in mapping are small areas of Cullasaja, Edneyville, and Plott soils. These soils are very deep. Cullasaja and Plott soils have a thicker dark surface layer than that of the Cleveland and Chestnut soils. Cullasaja soils have more than 35 percent rock fragments in the subsoil. Cullasaja soils are in drainageways. Edneyville soils are on south- to west-facing slopes. Plott soils are on north- to east-facing slopes. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Cleveland and Chestnut soils but have a redder subsoil or fewer stones on the surface.

Much of the acreage in this map unit is wooded. Some areas are used for pasture, building site development, or recreational activities. In most areas traversing the landscape is difficult and dangerous.

This map unit is poorly suited to woodland because of the slope and severe climatic conditions, which cause low productivity. The unit is not used for commercial timber production. Trees are stunted, twisted, or otherwise damaged by wind and ice. Stones, the depth to bedrock, numerous areas of Rock outcrop, and the hazard of erosion also are management concerns. On south- and west-facing slopes, the most common trees are scarlet oak, chestnut oak, eastern white pine, pitch pine, Virginia pine, and hickory. On north- and east-facing slopes, the most common trees are northern red oak, sweet birch, and eastern hemlock.

This map unit is poorly suited to pasture because of the slope. Stones, the depth to bedrock, numerous areas of Rock outcrop, and the hazard of erosion also are management concerns. Most of the large stones are removed when sod is established. Operating farm equipment is dangerous because of the slope. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Generally, weeds are controlled and fertilizer and lime are applied by hand. Keeping the pasture in good condition can help to control erosion.

This map unit is poorly suited to building site development because of the depth to bedrock and the slope. Stones, numerous areas of Rock outcrop, and the hazard of erosion also are management concerns. Because of cold winter temperatures and high winds, building sites are used mainly for summer homes. Revegetating disturbed areas is difficult and expensive. Excavation for dwellings with basements is hampered by the depth to bedrock. Septic tank absorption fields should be dug by hand because of the slope. Because the hazard of ground-water contamination or stream pollution is severe in areas of the shallow Cleveland soil, it should not be used as a site for septic tank absorption fields. This map unit is in areas where the amount of annual rainfall exceeds 70 inches. Revegetating building sites as soon as possible helps to control erosion in these areas.

This map unit is poorly suited to recreational uses, such as overlooks and hiking trails. The slope, the depth to bedrock, and the hazard of erosion are management concerns. Freezing and thawing increase the need for trail maintenance.

This map unit is not used for crops. The slope, stones, the depth to bedrock, numerous areas of Rock outcrop, and the hazard of erosion are management concerns.

This map unit is poorly suited to access roads because of the depth to bedrock and the slope. Numerous areas of Rock outcrop and the hazard of erosion also are management concerns. This unit is used for access roads, however, because building site development is an important use. Building and maintaining the roads are difficult and expensive. Because of a scarcity of soil material, grading the roadbeds is very difficult. Drilling and blasting of the hard bedrock are commonly needed. Building the roadbed on natural soil minimizes slumping. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality.

The capability subclass is VIIe in areas of the Cleveland and Chestnut soils and VIIIs in areas of the Rock outcrop. Based on northern red oak as the indicator species, the woodland ordination symbol is 2R in areas of the Cleveland and Chestnut soils. The Rock outcrop has not been assigned a woodland ordination symbol.

CpF—Cleveland-Chestnut-Rock outcrop complex, windswept, 50 to 95 percent slopes. This very steep map unit occurs mainly as areas of a shallow, somewhat excessively drained Cleveland soil; a moderately deep, well drained Chestnut soil; and Rock outcrop. The unit is on head slopes in the intermediate mountains. Scattered stones and boulders are on the surface. Individual areas range from 20 to 100 acres in size. Typically, they are 40 to 50 percent Cleveland soil, 20 to 30 percent Chestnut soil, and 10 to 20 percent Rock outcrop. The two soils and Rock outcrop occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Cleveland soil are as follows—

Surface layer:
0 to 5 inches, black sandy loam

Subsoil:
5 to 9 inches, dark yellowish brown loam
9 to 17 inches, yellowish brown loam

Hard bedrock:
17 inches, granite

The typical sequence, depth, and composition of the layers of the Chestnut soil are as follows—

Surface layer:
0 to 5 inches, dark brown gravelly fine sandy loam
5 to 10 inches, dark yellowish brown gravelly fine sandy loam

Subsoil:
10 to 24 inches, dark yellowish brown gravelly fine sandy loam

Underlying material:
24 to 36 inches, multicolored cobbly fine sandy loam

Weathered bedrock:
36 to 45 inches, multicolored gneiss

Permeability is moderately rapid in the Cleveland and Chestnut soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to hard bedrock is 10 to 20 inches in the Cleveland soil. The depth to weathered bedrock is 20 to 40 inches in the Chestnut soil. The organic matter content in the surface layer of both soils ranges from low to high. Mass movement occurs when the soils slide off the rock contact during the wet season.

Included in mapping are small areas of Cullasaja, Edneyville, and Plott soils. These soils are very deep. Cullasaja and Plott soils have a thicker dark surface layer than that of the Cleveland and Chestnut soils. Cullasaja soils have more than 35 percent rock fragments in the subsoil. Cullasaja soils are in drainageways. Edneyville soils are on south- to west-facing slopes. Plott soils are on north- to east-facing slopes. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Cleveland and Chestnut soils but have a redder subsoil or fewer stones on the surface.

Much of the acreage in this map unit is wooded. Some areas are used for building site development or recreational activities. In most areas traversing the landscape is difficult and dangerous.

This map unit is poorly suited to woodland because of the slope and severe climatic conditions, which cause low productivity. The unit is not used for timber production. Trees are stunted, twisted, or otherwise damaged by wind and ice. Stones, the depth to bedrock, numerous areas of Rock outcrop, and the hazard of erosion also are management concerns. On south- and west-facing slopes, the most common trees are scarlet oak, chestnut oak, eastern white pine, pitch pine, Virginia pine, and hickory. On north- and east-facing slopes, the most common trees are northern red oak, sweet birch, and eastern hemlock.

This map unit is poorly suited to building site development because of the depth to bedrock and the slope. Stones, numerous areas of Rock outcrop, and the hazard of erosion also are management concerns. Because of cold winter temperatures and high winds, building sites are used mainly for summer homes. Revegetating disturbed areas is difficult and expensive. Excavation for dwellings with basements is hampered by the depth to bedrock. Septic tank absorption fields are dug by hand because of the slope. Because the hazard of ground-water contamination or stream pollution is severe in areas of the shallow Cleveland soil, it should not be used as a site for septic tank absorption fields. This map unit is in areas where the amount of annual rainfall exceeds 70 inches. Revegetating building sites as soon as possible helps to control erosion in these areas.

This map unit is poorly suited to recreational uses but is used for hiking trails that access scenic overlooks. The slope, the depth to bedrock, and the hazard of erosion are management concerns. Freezing and thawing increase the need for trail maintenance.

This map unit is not used for crops or pasture. The slope is the main management concern. Stones, the depth to bedrock, numerous areas of Rock outcrop, and the hazard of erosion also are management concerns.

This map unit is poorly suited to access roads because of the slope and the depth to bedrock. Numerous areas of Rock outcrop and the hazard of erosion also are management concerns. This unit is used for access roads, however, where the value of building sites is very high and other access is not available. Building and maintaining the roads are difficult and expensive. Because of a scarcity of soil material, grading the roadbeds is very difficult. Drilling and blasting of the hard bedrock are commonly needed. Building the roadbed on natural soil minimizes slumping. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality.

The capability subclass is VIIe in areas of the Cleveland and Chestnut soils and VIIIs in areas of the Rock outcrop. Based on northern red oak as the indicator species, the woodland ordination symbol is 2R

in areas of the Cleveland and Chestnut soils. The Rock outcrop has not been assigned a woodland ordination symbol.

CsD—Cullasaja very cobbly fine sandy loam, 15 to 30 percent slopes, extremely bouldery. This map unit consists mainly of moderately steep, very deep, well drained Cullasaja and similar soils in coves below areas of rock outcrop or on toe slopes at the base of nearly vertical rock cliffs. Many boulders and stones are on the surface. Most areas of this map unit are in the intermediate mountains in the southeastern and southwestern parts of the county. Areas in the coves are bowl shaped in the lower part and extend as narrow bands along drainageways. Areas on the toe slopes are long and narrow. Individual areas range from 3 to 50 acres in size.

The typical sequence, depth, and composition of the layers of the Cullasaja soil are as follows—

Surface layer:

0 to 2 inches, dark yellowish brown very cobbly fine sandy loam

2 to 15 inches, very dark grayish brown very cobbly fine sandy loam

Subsoil:

15 to 28 inches, dark yellowish brown very cobbly sandy loam

28 to 65 inches, dark yellowish brown very cobbly loamy sand

Permeability is moderately rapid. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. Runoff from the adjacent higher areas is concentrated in concave areas. The seasonal high water table is more than 6 feet below the surface. The depth to bedrock is more than 72 inches. The organic matter content in the surface layer is high or very high. Many stones and boulders are on the surface, making tillage impractical. In some areas the boulders are as large as 30 feet long and 15 feet high.

Included in mapping are small areas of Tuckasegee soils. These soils have less than 35 percent rock fragments in the subsoil. They are in areas between drainageways. Also included are small areas of rubble land and moderately well drained to somewhat poorly drained soils. Contrasting inclusions make up about 15 percent of this map unit.

Also included in mapping are some soils that are similar to the Cullasaja soil but have a dark surface layer that is less than 10 or more than 20 inches thick or have a seasonal high water table 3 to 6 feet below the surface. Where the surface layer is less than 10 inches thick, the soils are on south- to west-facing slopes. Where the surface layer is more than 20 inches thick, the soils are on north- to east-facing slopes.

Most of the acreage in this map unit is used as woodland. Other uses include building site development and recreational activities.

This map unit is poorly suited to woodland because of the large stones. The hazard of erosion is a moderate management concern, and an equipment limitation is a severe management concern. The slope and runoff from the adjacent higher areas also are management concerns. This unit is desirable for timber production, however, because of high productivity and valuable species. Yellow-poplar is the most common tree. Other trees include black cherry, American beech, yellow buckeye, eastern hemlock, and eastern white pine at the lower elevations and black cherry, sweet birch, northern red oak, and sugar maple at the higher elevations.

Hardwoods are preferred for timber production. Reforestation of hardwoods occurs dominantly through sprouting. Cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

Because of the stones and boulders, operating equipment, building access roads, and harvesting timber are difficult and expensive. In some areas the boulders are so large that removing them requires drilling and blasting. Large stones and boulders are so numerous in most areas that the use of wheeled equipment is impractical. Timber is damaged by conventional harvesting when falling trees strike the large stones and boulders. Cable logging is limited in many areas because nearly vertical rock cliffs are on the upslope side of the area.

This map unit is poorly suited to building site development because of the slope, the large stones, and caving of cutbanks. Runoff from the higher areas also is a management concern. Some areas of this unit are used for building site development because of the high value of the land. A water table may be at a depth of 6 to 10 feet. Because of the stones and boulders, building is difficult and expensive. On rare occasions falling rocks damage buildings. Excavation for dwellings with basements is hampered by underground water in some areas. A drainage system is needed in these areas. Building sites should be designed so that runoff from the adjacent higher areas is diverted. Water from seeps and springs also should be diverted. Sites that are wet because of seeps, springs, or runoff should not be used for septic tank absorption fields.

This map unit is poorly suited to recreational uses, such as camp sites and hiking trails. The stones and boulders, the slope, and the hazard of erosion are

management concerns. This unit is preferred by campers, however, because it is near streams and has shade. Water sources, such as springs, are common in areas of this soil.

This map unit is not used for pasture, hayland, specialty crops, or row crops because of the stones and boulders and the slope.

This map unit is poorly suited to access roads because of the slope and the large stones. It is used for this purpose, however, because timber production and building site development are uses. The stones and boulders are a major problem. Runoff from the higher areas also is a management concern. Because of the stones and boulders, road building is difficult and expensive. Falling rocks may increase the cost of road maintenance. The roads should be designed so that runoff from the adjacent higher areas is properly diverted. Water from seeps and springs should be diverted to outlets. The number of culverts needed per mile of road is very high compared to the number needed on soils in the uplands. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIIs. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8X.

CsE—Cullasaja very cobbly fine sandy loam, 30 to 50 percent slopes, extremely bouldery. This map unit consists mainly of steep, very deep, well drained Cullasaja and similar soils in coves below areas of rock outcrop or on toe slopes at the base of nearly vertical rock cliffs. Many boulders and stones are on the surface. Most areas of this map unit are in the intermediate mountains in the southeastern and southwestern parts of the county. Areas in the coves are bowl shaped in the lower part and extend as narrow bands along drainageways. Areas on the toe slopes are long and narrow. Individual areas range from 3 to 50 acres in size.

The typical sequence, depth, and composition of the layers of the Cullasaja soil are as follows—

Surface layer:

0 to 2 inches, dark yellowish brown very cobbly fine sandy loam

2 to 15 inches, very dark grayish brown very cobbly fine sandy loam

Subsoil:

15 to 28 inches, dark yellowish brown very cobbly sandy loam

28 to 65 inches, dark yellowish brown very cobbly loamy sand

Permeability is moderately rapid. Surface runoff is slow in areas where undisturbed forest litter is on the surface and very rapid in areas without forest litter. Runoff from the adjacent higher areas is concentrated in concave areas. The seasonal high water table is more than 6 feet below the surface. The depth to bedrock is more than 72 inches. The organic matter content in the surface layer is high or very high. Many stones and boulders are on the surface. In some areas the boulders are as large as 30 feet long and 15 feet high.

Included in mapping are small areas of Tuckasegee soils. These soils have less than 35 percent rock fragments in the subsoil. They are in areas between drainageways. Also included are small areas of rubble land and moderately well drained to somewhat poorly drained soils. Contrasting inclusions make up about 15 percent of this map unit.

Also included in mapping are some soils that are similar to the Cullasaja soil but have a dark surface layer that is less than 10 or more than 20 inches thick or have a seasonal high water table 3 to 6 feet below the surface. Where the surface layer is less than 10 inches thick, the soils are on south- to west-facing slopes. Where the surface layer is more than 20 inches thick, the soils are on north- to east-facing slopes.

Most of the acreage in this map unit is used as woodland. Some areas are used for building site development.

This map unit is poorly suited to woodland because of the slope. The hazard of erosion, an equipment limitation, and the stones and boulders on the surface are severe management concerns. Runoff from the adjacent higher areas also is a management concern. This unit is desirable for timber production, however, because of high productivity and valuable species. Yellow-poplar is the most common tree. Other trees include black cherry, American beech, yellow buckeye, eastern hemlock, and eastern white pine at the lower elevations and black cherry, sweet birch, northern red oak, and sugar maple at the higher elevations.

Hardwoods are preferred for timber production. Reforestation of hardwoods occurs dominantly through sprouting. Cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

Because of the stones and boulders, operating equipment, building access roads, and harvesting timber are difficult and expensive. In some areas the boulders are so large that removing them requires drilling and blasting. Large stones and boulders are so numerous in most areas that the use of wheeled equipment is impractical. Timber is damaged by

conventional harvesting when falling trees strike the large stones and boulders. Cable logging is limited in many areas because nearly vertical rock cliffs are on the upslope side of the area.

This map unit is poorly suited to building site development because of the slope, the large stones, and caving of cutbanks. Runoff from the higher areas also is a management concern. Some areas near the town of Highlands are used as building sites because of the high value of land. A water table may be at a depth of 6 to 10 feet. Because of the stones and boulders, building is difficult and expensive. On rare occasions falling rocks damage buildings. Excavation for dwellings with basements is hampered by underground water in some areas. A drainage system is needed in these areas. Building sites should be designed so that runoff from the adjacent higher areas is diverted. Water from seeps and springs also should be diverted. Sites that are wet because of seeps, springs, or runoff should not be used for septic tank absorption fields.

This map unit is not used for pasture, hayland, specialty crops, or row crops because of the stones and boulders and the slope.

This map unit is poorly suited to access roads because of the slope and the large stones. It is used for this purpose, however, because timber production and building site development are uses. Runoff from the higher areas also is a management concern. Because of the stones and boulders, road building is difficult and expensive. Falling rocks may increase the cost of road maintenance. The roads should be designed so that runoff from the adjacent higher areas is properly diverted. Water from seeps and springs should be diverted to outlets. The number of culverts needed per mile of road is very high compared to the number needed on soils in the uplands. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIIs. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8R.

CuD—Cullasaja-Tuckasegee complex, 15 to 30 percent slopes, stony. This moderately steep map unit consists mainly of very deep, well drained Cullasaja and Tuckasegee soils in coves, in drainageways, and on toe slopes in the intermediate mountains. Typically, the Tuckasegee soil is between the drainageways, and the Cullasaja soil is along the drainageways. Scattered stones and boulders are on the surface. Areas in the coves are bowl shaped in the lower part and extend as narrow bands along drainageways. Areas on the toe slopes and in the drainageways are long and narrow. Individual areas range from 4 to 60 acres in size. Typically, they are 45 to 55 percent Cullasaja soil and 25 to 35 percent Tuckasegee soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Cullasaja soil are as follows—

Surface layer:

0 to 10 inches, very dark grayish brown cobbly sandy clay loam

10 to 17 inches, dark brown cobbly fine sandy loam

Subsoil:

17 to 32 inches, strong brown cobbly sandy loam

32 to 65 inches, strong brown cobbly loamy sand

The typical sequence, depth, and composition of the layers of the Tuckasegee soil are as follows—

Surface layer:

0 to 9 inches, black fine sandy loam

9 to 13 inches, dark brown fine sandy loam

Subsoil:

13 to 26 inches, dark brown fine sandy loam

26 to 47 inches, brown sandy clay loam

47 to 65 inches, strong brown cobbly sandy clay loam

Permeability is moderately rapid in the Cullasaja and Tuckasegee soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. Runoff from the adjacent higher areas is concentrated in concave areas. The seasonal high water table is more than 6 feet below the surface. The depth to bedrock is more than 72 inches. The organic matter content in the surface layer is high or very high. The stones make tillage difficult in areas of the Cullasaja soil. The Tuckasegee soil is friable and can be tilled throughout a fairly wide range in moisture content.

Included in mapping are small areas of Edneyville soils on small knolls. These soils have a surface layer that is thinner or lighter in color than that of the Cullasaja and Tuckasegee soils. Also included are small areas of moderately well drained or somewhat poorly drained soils around springs and seeps and small areas of rubble land where more than 75 percent of the surface is covered by stones and boulders. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Cullasaja and Tuckasegee soils but have a dark surface layer that is less than 10 or more than 20 inches thick or have a seasonal high water table 3 to 6 feet below the surface. Where the surface layer is

less than 10 inches thick, the soils are on south- to west-facing slopes. Where the surface layer is more than 20 inches thick, the soils are on north- to east-facing slopes.

Much of the acreage in this map unit is used as woodland. Other uses include recreational activities, pasture, building site development, and specialty crops.

This map unit is only moderately suited to woodland because of the slope. The hazard of erosion and an equipment limitation are moderate management concerns. Stones and runoff from the adjacent higher areas also are management concerns. This unit is desirable for timber production because of high productivity and valuable species. It commonly is used for this purpose on National Forest lands. Privately owned areas are rarely used for timber production because of the higher profits from building site development. Yellow-poplar is the most common tree. Other trees include black cherry, American beech, yellow buckeye, eastern hemlock, and eastern white pine at the lower elevations and black cherry, sweet birch, northern red oak, and sugar maple at the higher elevations. Windblown seeds from such species as yellow-poplar, black locust, sugar maple, eastern hemlock, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production. Reforestation of hardwoods occurs dominantly through sprouting. In cutover stands cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

In cleared areas eastern white pine can be successfully established. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

Care is needed to prevent soil compaction. The use of heavy equipment should be restricted to dry periods or to periods when the ground is frozen. When the soils are wet, skid trails and unsurfaced roads are highly erodible and very slick because of the organic matter content.

This map unit is poorly suited to recreational uses, such as camp sites and trailer parks, because of the slope and stones. The hazard of erosion also is a management concern. Water sources, such as springs, are common in areas of this map unit.

This map unit is only moderately suited to pasture because of the slope. Stones, the hazard of erosion, runoff from the adjacent higher areas, and damage to streambanks are management concerns. Operating farm equipment is difficult because of the slope. Most of the large stones are removed when sod is established. The stones damage farm equipment used for the establishment and maintenance of pasture in areas of the Cullasaja soil. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Properly locating watering facilities, stream crossings, and fences can help to prevent damage to streambanks and improve water quality. Keeping the pasture in good condition can help to control erosion.

This map unit is poorly suited to building site development because of the slope, large stones, and caving of cutbanks. Runoff from the adjacent higher areas and the hazard of erosion also are management concerns. A water table may be at a depth of 6 to 10 feet. The Tuckasegee soil is better suited to building site development than the Cullasaja soil. Excavation for dwellings with basements is hampered by underground water in some areas. A drainage system is needed in these areas. Building sites should be designed so that runoff from the adjacent higher areas is diverted. Water from seeps and springs also should be diverted. Sites that are wet because of seeps, springs, or runoff should not be used for septic tank absorption fields.

This map unit is poorly suited to specialty crops, such as ginseng, landscaping plants, and Christmas trees, but some areas are used for these crops. Stones, the slope, the hazard of erosion, and runoff from the adjacent higher areas are management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, and rhododendron. Fraser fir and eastern white pine are grown for use as Christmas trees. Most of the large stones are removed when areas of this unit are converted to cropland. Preparing a plant bed and harvesting plants remain difficult in areas of the Cullasaja soil because of the many small stones. Trees and other plants are easily dug and balled and burlapped in areas of the Tuckasegee soil. Operating farm equipment is difficult because of the slope. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff.

This map unit is not used for row crops. The slope is the main management concern. Stones, runoff from the higher areas, and the hazard of erosion also are management concerns.

This map unit is poorly suited to access roads because of the slope and large stones. Runoff from the adjacent higher areas, springs, seeps, and the hazard of erosion also are management concerns. The U.S. Forest Service generally does not use areas of this map

unit for access roads, but some areas are crossed by short sections of roads perpendicular to streams. A few privately owned areas are used for access roads. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. Building the roads in upslope areas near the uplands helps to avoid the springs, seeps, and large stones. Building the roadbed on natural soil minimizes slumping. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating areas that have been cut and filled is difficult because of the slope. Hydroseeding is a good way to revegetate steep roadbanks. The roads should be designed so that runoff from the adjacent higher areas is diverted. Water from seeps and springs should be diverted to outlets. The number of culverts needed per mile of road is very high compared to the number needed on soils in the uplands.

The capability subclass is VIIs in areas of the Cullasaja soil and VIe in areas of the Tuckasegee soil. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8R.

CuE—Cullasaja-Tuckasegee complex, 30 to 50 percent slopes, stony. This steep map unit consists mainly of very deep, well drained Cullasaja and Tuckasegee soils in coves, in drainageways, and on toe slopes in the intermediate mountains. Typically, the Tuckasegee soil is between the drainageways, and the Cullasaja soil is along the drainageways. Scattered stones and boulders are on the surface. Areas in the coves are bowl shaped in the lower part and extend as narrow bands along drainageways. Areas on the toe slopes and in the drainageways are long and narrow. Individual areas range from 5 to 40 acres in size. Typically, they are 35 to 45 percent Cullasaja soil and 35 to 45 percent Tuckasegee soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Cullasaja soil are as follows—

Surface layer:

0 to 10 inches, very dark grayish brown cobbly sandy clay loam

10 to 17 inches, dark brown cobbly fine sandy loam

Subsoil:

17 to 32 inches, strong brown cobbly sandy loam

32 to 65 inches, strong brown cobbly loamy sand

The typical sequence, depth, and composition of the layers of the Tuckasegee soil are as follows—

Surface layer:

0 to 9 inches, black fine sandy loam

9 to 13 inches, dark brown fine sandy loam

Subsoil:

13 to 26 inches, dark brown fine sandy loam

26 to 47 inches, brown sandy clay loam

47 to 65 inches, strong brown cobbly sandy clay loam

Permeability is moderately rapid in the Cullasaja and Tuckasegee soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid or very rapid in areas without forest litter. Runoff from the adjacent higher areas is concentrated in concave areas. The seasonal high water table is more than 6 feet below the surface. The depth to bedrock is more than 72 inches. The organic matter content in the surface layer is high or very high.

Included in mapping are small areas of Chestnut, Edneyville, and Plott soils. Chestnut and Edneyville soils have a surface layer that is thinner or lighter in color than that of the Cullasaja and Tuckasegee soils. Also, Chestnut soils are moderately deep over weathered bedrock. In Plott soils the underlying material is saprolite. Chestnut, Edneyville, and Plott soils are on small knolls. Also included are springs, seeps, and small areas of rubble land where more than 75 percent of the surface is covered by stones and boulders. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Cullasaja and Tuckasegee soils but have a dark surface layer that is less than 10 or more than 20 inches thick or have a seasonal high water table 3 to 6 feet below the surface. Where the surface layer is less than 10 inches thick, the soils are on south- to west-facing slopes. Where the surface layer is more than 20 inches thick, the soils are on north- to east-facing slopes.

Most of the acreage in this map unit is used as woodland. Other uses include recreational activities, pasture, and building site development.

This map unit is poorly suited to woodland because of the slope. The hazard of erosion and an equipment limitation are severe management concerns. Stones, runoff from the adjacent higher areas, and the slope also are management concerns. This unit is desirable for timber production, however, because of high productivity and valuable species. It commonly is used for this purpose on National Forest lands. Privately owned areas are rarely used for timber production because of the higher profits from building site development. Yellow-poplar is the most common tree. Other trees include black cherry, American beech,

yellow buckeye, eastern hemlock, and eastern white pine at the lower elevations and black cherry, sweet birch, northern red oak, and sugar maple at the higher elevations. Windblown seeds from such species as yellow-poplar, black locust, sugar maple, eastern hemlock, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production. Reforestation of hardwoods occurs dominantly through sprouting. In cutover stands cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

In cleared areas eastern white pine can be successfully established. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

Care is needed to prevent soil compaction. Using wheeled and tracked equipment is difficult because of the slope. The use of heavy equipment should be restricted to dry periods or to periods when the ground is frozen. When the soils are wet, skid trails and unsurfaced roads are highly erodible and very slick because of the organic matter content.

This map unit is poorly suited to recreational uses, such as hiking trails. The slope, stones, and the hazard of erosion are management concerns. The trails are very slick during wet periods.

This map unit is poorly suited to pasture because of the slope. Stones, the hazard of erosion, and runoff from the adjacent higher areas also are management concerns. Most of the large stones are removed when sod is established. Operating farm equipment is dangerous because of the slope. Erosion is a problem in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Generally, weeds are controlled and fertilizer and lime are applied by hand. Seeps, springs, and streams are commonly developed as water sources for livestock. Keeping the pasture in good condition helps to control erosion.

This map unit is poorly suited to building site development because of the slope, large stones, and caving of cutbanks. Runoff from the adjacent higher areas and the hazard of erosion also are management concerns. A water table may be at a depth of 6 to 10 feet. The Tuckasegee soil is better suited to building site development than the Cullasaja soil. Excavation for dwellings with basements is hampered by underground water in some areas. A drainage system is needed in these areas. Building sites should be designed so that runoff from the adjacent higher areas is diverted. Water from seeps and springs also should be diverted. Septic tank absorption fields should be dug by hand because of the slope. Sites that are wet because of seeps, springs, or runoff should not be used for septic tank absorption fields. Seeding cutbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating large areas that have been cut and filled is difficult because of the slope. Hydroseeding is a good way to revegetate steep banks.

This map unit is not used for crops. The slope is the main management concern. Stones, runoff from the higher areas, and the hazard of erosion also are management concerns.

This map unit is poorly suited to access roads because of the slope and large stones. Runoff from the adjacent higher areas, springs, seeps, and the hazard of erosion also are management concerns. The U.S. Forest Service generally does not use areas of this map unit for access roads, but some areas are crossed by short sections of roads perpendicular to streams. A few privately owned areas are used for access roads. Building and maintaining the roads are difficult and expensive. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. Building the roads in upslope areas near the uplands helps to avoid the springs, the seeps, and the large stones. Building the roadbed on natural soil minimizes slumping. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating large areas that have been cut and filled is difficult because of the slope. Hydroseeding is a good way to revegetate steep roadbanks. The roads should be designed so that runoff from the adjacent higher areas is diverted. Water from seeps and springs should be diverted to outlets. The number of culverts needed per mile of road is very high compared to the number needed on soils in the uplands.

The capability subclass is VIIs in areas of the Cullasaja soil and VIIe in areas of the Tuckasegee soil. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8R.

CuF—Cullasaja-Tuckasegee complex, 50 to 95 percent slopes, stony. This very steep map unit consists mainly of very deep, well drained Cullasaja and Tuckasegee soils. The unit is generally at the head of streams, in drainageways, and on toe slopes in the intermediate mountains. A few areas are downstream from waterfalls. Typically, the Cullasaja soil is along the drainageways, and the Tuckasegee soil is between the

drainageways. Scattered stones and boulders are on the surface. Areas are long, narrow, and parallel the drainageways. Individual areas range from 5 to 10 acres in size. Typically, they are 45 to 55 percent Cullasaja soil and 25 to 35 percent Tuckasegee soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Cullasaja soil are as follows—

Surface layer:

0 to 10 inches, very dark grayish brown cobbly sandy clay loam

10 to 17 inches, dark brown cobbly fine sandy loam

Subsoil:

17 to 32 inches, strong brown cobbly sandy loam

32 to 65 inches, strong brown cobbly loamy sand

The typical sequence, depth, and composition of the layers of the Tuckasegee soil are as follows—

Surface layer:

0 to 9 inches, black fine sandy loam

9 to 13 inches, dark brown fine sandy loam

Subsoil:

13 to 26 inches, dark brown fine sandy loam

26 to 47 inches, brown sandy clay loam

47 to 65 inches, strong brown cobbly sandy clay loam

Permeability is moderate in the Cullasaja and Tuckasegee soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid or very rapid in areas without forest litter. Runoff from the adjacent higher areas is concentrated in concave areas. The seasonal high water table is more than 6 feet below the surface. The depth to bedrock is more than 72 inches. The organic matter content in the surface layer is high or very high.

Included in mapping are small areas of Chestnut, Edneyville, and Plott soils. Chestnut and Edneyville soils have a surface layer that is thinner or lighter in color than that of the Cullasaja and Tuckasegee soils. Also, Chestnut soils are moderately deep over weathered bedrock. In Plott soils the underlying material is saprolite. Chestnut, Edneyville, and Plott soils are on small knolls. Also included are springs, seeps, and small areas of rubble land where more than 75 percent of the surface is covered by stones and boulders. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Cullasaja and Tuckasegee soils but have a dark surface layer that is less than 10 or more than 20 inches thick or have a seasonal high water table 3 to 6 feet below the surface. Where the surface layer is less than 10 inches thick, the soils are on south- to west-facing slopes. Where the surface layer is more than 20 inches thick, the soils are on north- to east-facing slopes.

Nearly all of the acreage in this map unit is used as woodland. Some National Forest lands are used for recreational activities.

This map unit is poorly suited to woodland because of the slope. The hazard of erosion and an equipment limitation are severe management concerns. Stones and runoff from the adjacent higher areas also are management concerns. This unit is desirable for timber production because of high productivity and valuable species. Because this unit occurs as small, long, narrow areas, however, it is generally managed with the surrounding uplands. Yellow-poplar is the most common tree. Other trees include black cherry, American beech, yellow buckeye, eastern hemlock, and eastern white pine at the lower elevations and black cherry, sweet birch, northern red oak, and sugar maple at the higher elevations.

Hardwoods are preferred for timber production. Reforestation of hardwoods occurs dominantly through sprouting. Cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

The slope restricts the kinds of equipment that can be used. Operating wheeled or tracked equipment is dangerous because of the slope. Cable yarding is safer, disturbs the soil less, and maintains the productivity of the soil. When the soils are wet, unsurfaced roads are slick, soft, and dangerous because of the organic matter content.

This map unit is poorly suited to hiking trails. The slope, stones, and the hazard of erosion are management concerns.

This map unit is not used for pasture, building site development, or crops. The slope is the main management concern. Stones, the hazard of erosion, and runoff also are management concerns.

This map unit is poorly suited to access roads because of the slope and large stones. Runoff from the adjacent higher areas, springs, seeps, and the hazard of erosion also are management concerns. The U.S. Forest Service generally does not use areas of this map unit for access roads, but some areas are crossed by short sections of roads perpendicular to streams. A few privately owned areas also are crossed by access roads. Building and maintaining the roads are difficult and expensive. Building the roads in upslope areas near the uplands helps to avoid the springs, the seeps,

and the large stones. Building the roadbed on natural soil minimizes slumping. Road failures are common. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating large areas that have been cut and filled is difficult because of the slope. The roads should be designed so that runoff from the adjacent higher areas is diverted. Placing a slight tilt in the roadbed so that water flows off the downhill side is a better way of managing water than ditches, which are impractical because banks slump. Water from seeps and springs should be diverted to outlets. The number of culverts needed per mile of road is very high compared to the number needed on soils in the uplands.

The capability subclass is VIIs in areas of the Cullasaja soil and VIIe in areas of the Tuckasegee soil. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8R.

DgB—Dellwood gravelly fine sandy loam, 0 to 5 percent slopes, frequently flooded. This map unit consists mainly of nearly level and gently sloping, very deep, moderately well drained Dellwood and similar soils on narrow flood plains along small streams. It is adjacent to stream channels where a prominent decrease in stream gradient occurs. The surface is very uneven. It has numerous knolls and dips resulting from fast moving floodwater causing erosion and deposition. Individual areas are oblong in shape and range from 3 to 25 acres in size.

The typical sequence, depth, and composition of the layers of the Dellwood soil are as follows—

Surface layer:

0 to 12 inches, very dark grayish brown gravelly fine sandy loam

Subsoil:

12 to 16 inches, dark yellowish brown cobbly sandy loam

Underlying material:

16 to 40 inches, multicolored very cobbly sand

Permeability is moderately rapid in the surface layer and rapid or very rapid in the subsoil and underlying material. Surface runoff is slow. This soil is subject to frequent flash flooding. The seasonal high water table is 2 to 4 feet below the surface. This soil is very deep over bedrock and shallow to strata of gravel, cobbles, and sand. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is moderate or high. Tillage is difficult because of rock fragments. Available water capacity is low.

Included in mapping are small areas of Nikwasi, Reddies, and Saunook soils. Nikwasi soils are poorly drained and very poorly drained. Reddies soils are moderately deep to strata of cobbles, pebbles, and sand. Saunook soils have more clay in the subsoil than the Dellwood soil. Nikwasi soils are in depressions. Reddies soils are in areas that have a smooth surface. Saunook soils are on toe slopes. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Dellwood soil but have a lighter colored or thinner surface layer or a thin subsoil.

Much of the acreage in this map unit is used as pasture or hayland. Other uses include row crops, specialty crops, recreational activities, building site development, and woodland.

This map unit is only moderately suited to pasture and hay because of the flooding and droughtiness. Tall fescue, ladino clover, and orchardgrass are grown. They are dormant in the droughty summer months. Rock fragments damage farm equipment used for the establishment, maintenance, and harvest of pasture and hayland. Properly locating watering facilities, stream crossings, and fences can help to prevent damage to streambanks and improve water quality.

This map unit is poorly suited to row crops because of the flooding. It is desirable for this purpose, however, because it is nearly level and gently sloping, is near a source of irrigation water, has very good access, and has good productivity if properly fertilized and irrigated. Rock fragments, droughtiness, drainage, ponding, runoff from the adjacent higher areas, and frost are management concerns. The most common crops are corn for silage, sweet corn, tomatoes, strawberries, and burley tobacco. Frost damage to sensitive crops can be significant because of poor air drainage. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat. The digging of root crops and tilling the soil are difficult because of the rock fragments. Split applications of fertilizer are needed because nutrients are easily leached. Properly designed plowing patterns are needed to keep drainage outlets open and to prevent the formation of depressions that pond water. Land shaping helps to open outlets and drain surface water. Tile drainage is needed for some crops during wet periods. Diversions, grassed field borders, and grassed waterways can divert water from the higher areas around row crops. Construction of water management structures is difficult because of the rock fragments and a scarcity of soil material. Irrigation is commonly used to protect some crops from frost and to supply supplemental water. Mulch is used in areas where strawberries are grown. It holds moisture, controls weeds, and keeps the berries clean. Equipment can be used on this soil shortly after a heavy rain. This good access allows for timely planting, managing, and

harvesting. Herbicides may be ineffective because of a high content of organic matter.

This map unit is poorly suited to specialty crops because of the flooding, but a few areas are used for balled and burlapped landscaping plants because the soil is nearly level and gently sloping, is near a source of irrigation water, has very good access, and has good productivity if properly fertilized and irrigated. Also, a few areas are used for cut Christmas trees. Rock fragments, the coarse texture of the soil, droughtiness, drainage, runoff from the adjacent higher areas, and ponding are management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, dog hobble, dogwood, white birch, and rhododendron. Fraser fir is grown for use as Christmas trees. Preparing a plant bed is difficult because of the rock fragments. Digging and preparing a ball for landscaping plants and Christmas trees is difficult because of the rock fragments and the coarse texture of the soil. Split applications of fertilizer are needed because nutrients are easily leached. Tile drainage is needed for some crops during wet periods. Irrigation is needed for some crops during dry periods. Equipment can be used on this soil shortly after a heavy rain. This good access allows for timely planting, managing, and harvesting.

This map unit is poorly suited to recreational uses because of the flooding but is used for camp sites, parks, picnic areas, ball fields, or tennis courts. It is preferred by campers because it is near streams, has shaded areas, and is crossed by many roads. Runoff from the adjacent higher areas is a management concern. If surface water is properly diverted to outlets, this soil can be used several hours after a heavy rain.

This map unit is poorly suited to building site development. The flooding is the main limitation.

This map unit is well suited to woodland. It is rarely used for commercial timber production, however, because of the small size of the areas and the higher profits from crops, pasture, and hayland. Yellow-poplar is the most common tree. Other trees include sweet birch, eastern hemlock, black cherry, and eastern white pine.

This map unit is poorly suited to access roads because of the flooding. It commonly is used for this purpose, however, because crops and recreation are important uses. Runoff from the adjacent higher areas is a management concern. Elevating roads during construction minimizes the damage caused by the flooding. The roads should be designed so that runoff is diverted. Wet spots should be drained. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality.

The capability subclass is Vw. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8F.

DrB—Dillard loam, 1 to 5 percent slopes, rarely flooded. This map unit consists mainly of nearly level and gently sloping, very deep, moderately well drained Dillard and similar soils on low stream terraces. Individual areas are long bands that parallel flood plains and range from 1 to 25 acres in size.

The typical sequence, depth, and composition of the layers of the Dillard soil are as follows—

Surface layer:
0 to 7 inches, dark brown loam

Subsoil:
7 to 21 inches, yellowish brown clay loam that has strong brown mottles
21 to 37 inches, yellowish brown clay loam that has light gray and strong brown mottles
37 to 50 inches, light gray loam that has strong brown mottles

Underlying material:
50 to 60 inches, yellowish brown sandy loam that has strong brown, light gray, and strong brown mottles

Permeability is moderately slow. Surface runoff is slow or medium. Crusting increases the hazard of ponding in concave areas where outlets have been blocked. The soil is subject to rare flooding. The seasonal high water table is 2 to 3 feet below the surface. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer ranges from low to high.

Included in mapping are small areas of Hemphill and Statler soils. Hemphill soils are very poorly drained, and Statler soils are well drained. Hemphill soils are in depressions. Statler soils are in slightly elevated areas. Also included are small areas of somewhat poorly drained soils. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Dillard soil but have a surface layer that is gravelly or is more than 7 inches thick.

Much of the acreage in this map unit is used for row crops. Other uses include pasture, hayland, specialty crops, building site development, and woodland.

This map unit is well suited to row crops. The flooding, runoff from the adjacent higher areas, ponding, the hazard of erosion, drainage, and frost are management concerns. The most common crops are corn for silage, sweet corn, tomatoes, strawberries, and burley tobacco. Properly designed plowing patterns are needed to keep drainage outlets open and to prevent

the formation of depressions. Land shaping helps to open outlets and drain surface water from depressions. Grassed field borders and grassed waterways can safely divert runoff. Drainage tile is needed to remove excess water from depressions. Irrigation is used to protect high-value crops from frost and to supply supplemental water. Mulch is used in areas where strawberries are grown. It holds moisture, controls weeds, and keeps the berries clean. Herbicides may be ineffective because of a high content of organic matter. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat.

This map unit is well suited to pasture and hay. The flooding, ponding, compaction, damage to streambanks, and the hazard of erosion are management concerns. Land shaping helps to open outlets and drain surface water from depressions. Grazing during wet periods causes compaction, increases the hazard of ponding, and reduces the rate of water infiltration. Properly locating watering facilities, stream crossings, and fences can help to prevent damage to streambanks and improve water quality. Tile drainage is needed in some wet spots.

This map unit is well suited to specialty crops, such as landscaping plants and Christmas trees. The flooding, runoff from the adjacent higher areas, ponding, and frost are management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, dogwood, dog hobble, white birch, and rhododendron. The species most commonly grown for use as Christmas trees is eastern white pine. Trees and other plants are easily dug and balled and burlapped. Water management practices similar to those used for row crops are appropriate.

This map unit is poorly suited to building site development because of the flooding, the wetness, and the restricted permeability. Runoff from adjacent areas, drainage, and ponding also are management concerns. Excavation for dwellings with basements is hampered by underground water. A drainage system is needed. Building sites should be designed so that runoff from the adjacent higher areas is diverted.

This map unit is well suited to woodland. It is not used for timber production, however, because of the small size of the areas and the higher profits from crops, building site development, pasture, and hayland. Yellow-poplar is the most common tree. Other trees include black cherry, American beech, sweet birch, and American sycamore.

This map unit is well suited or moderately suited to recreational uses. In some areas it is used for camping, parks, picnic areas, or tennis courts. Drainage, ponding, and the flooding are management concerns.

This map unit is poorly suited to access roads because of low strength. It is used for this purpose, however, because building site development and recreation are important uses. Runoff, the flooding, and ponding also are management concerns. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. The roads should be designed so that runoff from the adjacent higher areas is diverted. Roadbeds need to be elevated. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality.

The capability subclass is IIw. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 7A.

DsB—Dillsboro loam, 2 to 8 percent slopes. This map unit consists mainly of gently sloping, very deep, well drained Dillsboro and similar soils on high stream terraces, generally in depressions. Individual areas are irregular in shape and range from 3 to 25 acres in size.

The typical sequence, depth, and composition of the layers of the Dillsboro soil are as follows—

Surface layer:

0 to 12 inches, dark brown loam

Subsoil:

12 to 26 inches, strong brown clay loam
26 to 42 inches, strong brown clay
42 to 50 inches, strong brown clay loam
50 to 60 inches, strong brown loam

Permeability is moderate. Surface runoff is medium. A crust may form on the surface after rainfall. It can cause ponding in concave areas or where outlets have been blocked. The seasonal high water table is more than 6 feet below the surface. The depth to bedrock is more than 72 inches. The organic matter content in the surface layer is moderate or high.

Included in mapping are small areas of Braddock and Saunook soils. Braddock soils have an eroded surface layer of clay loam and a subsoil that is redder than that of the Dillsboro soil, and Saunook soils have less clay in the subsoil. Braddock soils are on small knolls. Saunook soils are in drainageways. Contrasting inclusions make up about 15 percent of this map unit.

Also included in mapping are some soils that are similar to the Dillsboro soil but have a gravelly surface layer, a thicker dark surface layer, or a redder subsoil or have a seasonal high water table 3 to 6 feet below the surface.

Much of the acreage in this map unit is used for row crops. Other uses include specialty crops, pasture, hayland, building site development, and woodland.

This map unit is well suited to row crops. Ponding and runoff are management concerns. Erosion is a hazard in the more sloping areas. Poor sources of irrigation water also are a management concern in some areas. The most common crops are corn for silage, sweet corn, tomatoes, strawberries, and burley tobacco. Irrigation is needed for some crops during dry periods. Irrigating areas on high stream terraces is difficult because sources of water commonly are more than 300 feet away or more than 40 feet lower in elevation. Mulch is used in areas where strawberries are grown. It holds moisture, helps to control erosion, controls weeds, and keeps the berries clean. Properly designed plowing patterns are needed to keep drainage outlets open and to prevent the formation of depressions. Land shaping helps to open outlets and drain surface water from depressions. Minimum tillage and crop residue management maintain the content of organic matter, the rate of water infiltration, and tilth. Grassed field borders and grassed waterways can safely divert runoff. Contour farming, stripcropping, and proper crop rotations conserve soil and water. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat.

This map unit is well suited to specialty crops, such as apples, landscaping plants, and Christmas trees. It is especially well suited to crops that are not commonly irrigated. Irrigation water may be difficult to obtain in some areas. Runoff and ponding are management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, dogwood, white birch, and rhododendron. Fraser fir and eastern white pine are grown for use as Christmas trees. Trees and other plants are easily dug and balled and burlapped. Water management practices similar to those used for row crops are appropriate.

This map unit is well suited to pasture and hay. Alfalfa grows particularly well on this soil. Soil compaction is a management concern. Land shaping helps to open outlets and drain surface water from depressions. Grazing during wet periods causes compaction, increases the hazard of ponding, and reduces the rate of water infiltration. Keeping the pasture and hayland in good condition can help to control erosion.

This map unit is only moderately suited to building site development because of the restricted permeability, a moderate shrink-swell potential, and a high content of clay in the subsoil. Runoff and ponding also are management concerns. A water table may be at a depth of 6 to 10 feet. Excavation for dwellings with basements is hampered by underground water in some areas. A drainage system is needed in these areas. Building sites should be designed so that runoff is diverted.

This map unit is well suited to woodland. It is not used for timber production, however, because of the small size of the areas and the higher profits from crops, building site development, pasture, and hayland. Yellow-poplar is the most common tree. Black walnut grows well on this soil. Other trees include black cherry and American beech.

This map unit is well suited to recreational uses, such as camp sites and picnic areas. It is rarely used for these purposes, however, because it is not near streams and generally has few trees and little shade.

This map unit is poorly suited to access roads because of low strength. It commonly is used for this purpose, however, because building site development is an important use. Runoff and ponding are management concerns. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. The roads should be designed so that runoff is properly diverted. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality.

The capability subclass is IIe. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 7A.

DsC—Dillsboro loam, 8 to 15 percent slopes. This map unit consists mainly of strongly sloping, very deep, well drained Dillsboro and similar soils on high stream terraces. Individual areas are irregular in shape and range from 3 to 25 acres in size.

The typical sequence, depth, and composition of the layers of the Dillsboro soil are as follows—

Surface layer:
0 to 12 inches, dark brown loam

Subsoil:
12 to 26 inches, strong brown clay loam
26 to 42 inches, strong brown clay
42 to 50 inches, strong brown clay loam
50 to 60 inches, strong brown loam

Permeability is moderate. Surface runoff is rapid. Crusting occurs in some areas. The seasonal high water table is more than 6 feet below the surface. The depth to bedrock is more than 72 inches. The organic matter content in the surface layer is moderate or high.

Included in mapping are small areas of Braddock and Saunook soils. Braddock soils have an eroded surface layer of clay loam and a subsoil that is redder than that of the Dillsboro, and Saunook soils have less clay in the subsoil. Braddock soils are on small knolls. Saunook

soils are in drainageways. Contrasting inclusions make up about 15 percent of this map unit.

Also included in mapping are some soils that are similar to the Dillsboro soil but have a gravelly surface layer, a thicker dark surface layer, or a redder subsoil.

Much of the acreage in this map unit is used as pasture or hayland. Other uses include row crops, specialty crops, building site development, and woodland.

This map unit is well suited to pasture and hay. Alfalfa grows particularly well on this soil. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Grazing during wet periods causes compaction, increases the hazard of ponding, and reduces the rate of water infiltration. Keeping the pasture and hayland in good condition can help to control erosion.

This map unit is only moderately suited to row crops because of the hazard of erosion. The slope, poor sources of irrigation water, and runoff also are management concerns. The most common crops are corn for silage, sweet corn, tomatoes, strawberries, and burley tobacco. Irrigation is needed for some high-value crops during dry periods. Irrigating areas on high stream terraces is difficult because sources of water commonly are more than 300 feet away or more than 40 feet lower in elevation. Mulch is used in areas where strawberries are grown. It holds moisture, controls weeds, and keeps the berries clean. Minimum tillage and crop residue management maintain the content of organic matter, the rate of water infiltration, and tilth. Grassed field borders and grassed waterways can carry water safely away. Contour farming, stripcropping, and proper crop rotations conserve soil and water. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat.

This map unit is only moderately suited to specialty crops because of the slope. The hazard of erosion and runoff also are management concerns. If irrigation is needed, water may be difficult to obtain in some areas. The most common crops are apples, landscaping plants, and Christmas trees. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, and rhododendron. Fraser fir and eastern white pine are grown for use as Christmas trees. Grassed field borders and grassed waterways in draws can divert water from the higher areas safely around crops.

This map unit is only moderately suited to building site development because of the slope, the restricted permeability, a moderate shrink-swell potential, and a high content of clay in the subsoil. Runoff and the hazard of erosion also are management concerns. A water table may be at a depth of 6 to 10 feet. Excavation for dwellings with basements is hampered by underground water in some areas. A drainage system is needed in these areas. Building sites should be designed so that runoff is diverted.

This map unit is well suited to woodland. It is not used for timber production, however, because of the small size of the areas and the higher profits from crops, building site development, pasture, and hayland. Yellow-poplar is the most common tree. Black walnut grows well on this soil. Other trees include black cherry and American beech.

This map unit is only moderately suited to recreational uses, such as camp sites and picnic areas, because of the slope. It is rarely used for these purposes because it is not near streams and generally has few trees and little shade. Erosion is a hazard.

This map unit is poorly suited to access roads because of low strength. It commonly is used for this purpose, however, because building site development is an important use. The slope, the hazard of erosion, and runoff are management concerns. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. The roads should be designed so that runoff is properly diverted. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality.

The capability subclass is IIIe. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 7A.

EdB—Edneyville-Chestnut complex, 2 to 8 percent slopes, stony. This gently sloping map unit consists mainly of a very deep, well drained Edneyville soil and a moderately deep, well drained Chestnut soil. The unit is on moderately broad ridgetops in the intermediate mountains. Scattered stones and boulders are on the surface. Individual areas are irregular in shape and range from 2 to 20 acres in size. Typically, they are 65 to 70 percent Edneyville soil and 15 to 20 percent Chestnut soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Edneyville soil are as follows—

Surface layer:

0 to 5 inches, dark yellowish brown fine sandy loam

Subsoil:

5 to 12 inches, strong brown loam
12 to 39 inches, strong brown fine sandy loam
39 to 43 inches, mottled yellowish brown, strong brown, and light yellowish brown fine sandy loam

Underlying material:
43 to 51 inches, mottled yellowish brown, yellowish red, and very pale brown sandy loam
51 to 64 inches, gray, black, and white sandy loam

The typical sequence, depth, and composition of the layers of the Chestnut soil are as follows—

Surface layer:
0 to 5 inches, dark brown gravelly fine sandy loam
5 to 10 inches, dark yellowish brown gravelly fine sandy loam

Subsoil:
10 to 24 inches, dark yellowish brown gravelly fine sandy loam

Underlying material:
24 to 36 inches, multicolored cobbly fine sandy loam

Weathered bedrock:
36 to 45 inches, multicolored gneiss

Permeability is moderately rapid in the Edneyville and Chestnut soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and medium in areas without forest litter. The depth to weathered bedrock is more than 60 inches in the Edneyville soil and 20 to 40 inches in the Chestnut soil. The organic matter content in the surface layer ranges from low to high. The surface layer is friable and easily tilled throughout a fairly wide range in moisture content.

Included in mapping are small areas of Cowee and Evard soils. These soils have more clay in the subsoil than the Edneyville and Chestnut soils. They are on south- to west-facing slopes. Contrasting inclusions make up about 15 percent of this map unit.

Also included in mapping are some soils that are similar to the Edneyville and Chestnut soils but have a redder subsoil or fewer stones on the surface.

Much of the acreage in this map unit is used for row crops. Other uses include building site development, specialty crops, and pasture. In the southern part of the county, high summer rainfall compensates for the droughtiness of these soils and increases productivity.

This map unit is well suited to row crops. Stones and the hazard of erosion are management concerns. Most of the large stones are removed when areas of this unit are converted to cropland. Cabbage is the most common crop. A small acreage is used for broccoli. Erosion is difficult to control in areas where cabbage is grown because of the high rainfall in the areas and the limited ground cover provided by the cabbage. Conservation practices, such as contour rows and diversions, can help to control erosion and runoff. Grassed field borders and grassed waterways can divert water safely around row crops. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat.

This map unit is only moderately suited to building site development because of the depth to bedrock. It commonly is used for this purpose near the town of Highlands and near Scaly Mountain. The slope, stones, and the hazard of erosion also are management concerns. Revegetating disturbed areas is difficult, mostly because of freezing and thawing. Excavation for dwellings with basements may be hampered by the depth to bedrock in the Chestnut soil. In some areas the Chestnut soil is too shallow to be used as a site for septic tank absorption fields. This map unit is in areas where the amount of annual rainfall exceeds 70 inches. Revegetating building sites as soon as possible helps to control erosion in these areas.

This map unit is well suited to specialty crops, such as landscaping plants and Christmas trees. The slope, stones, and the hazard of erosion are management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, and rhododendron. Fraser fir is grown for use as Christmas trees. Most of the large stones are removed when areas of this unit are converted to production of specialty crops. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff. Mulch can be used to help control erosion in cultivated areas where sod cannot be used.

This map unit is well suited to pasture and hay. The slope, stones, and the hazard of erosion are management concerns. Most of the large stones are removed when sod is established. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Cool season grasses, such as tall fescue and orchardgrass, can provide late season pasture. Keeping the pasture and hayland in good condition can help to control erosion.

This map unit is well suited to woodland. It is rarely used for timber production, however, because of the small size of the areas and the higher profits from crops and building site development. The slope and the hazard of erosion are management concerns. The most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, pitch pine, and hickory. Windblown seeds from such species as yellow-poplar, black locust, red maple, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good and hardwood seedlings are available. Reforestation of hardwoods occurs dominantly through sprouting. In cutover areas cutting

all trees and large shrubs increases the number and quality of the sprouts.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. This map unit is droughty. White pine is commonly planted where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

This map unit is only moderately suited to access roads because of frost action. It commonly is used for this purpose because building site development is an important use. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating disturbed areas is difficult, especially on south- to west-facing slopes that freeze and thaw in spring and fall.

The capability subclass is IIe in areas of the Edneyville soil and IIIe in areas of the Chestnut soil. Based on northern red oak as the indicator species, the woodland ordination symbol is 4A in areas of the Edneyville soil and 4D in areas of the Chestnut soil.

EdC—Edneyville-Chestnut complex, 8 to 15 percent slopes, stony. This strongly sloping map unit consists mainly of a very deep, well drained Edneyville soil and a moderately deep, well drained Chestnut soil. The unit is on moderately broad ridgetops in the intermediate mountains. Scattered stones and boulders are on the surface. Individual areas are irregular in shape and range from 5 to 30 acres in size. Typically, they are 50 to 60 percent Edneyville soil and 20 to 30 percent Chestnut soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Edneyville soil are as follows—

Surface layer:

0 to 5 inches, dark yellowish brown fine sandy loam

Subsoil:

5 to 12 inches, strong brown loam
12 to 39 inches, strong brown fine sandy loam
39 to 43 inches, mottled yellowish brown, strong brown, and light yellowish brown fine sandy loam

Underlying material:

43 to 51 inches, mottled yellowish brown, yellowish red, and very pale brown sandy loam
51 to 64 inches, gray, black, and white sandy loam

The typical sequence, depth, and composition of the layers of the Chestnut soil are as follows—

Surface layer:

0 to 5 inches, dark brown gravelly fine sandy loam
5 to 10 inches, dark yellowish brown gravelly fine sandy loam

Subsoil:

10 to 24 inches, dark yellowish brown gravelly fine sandy loam

Underlying material:

24 to 36 inches, multicolored cobbly fine sandy loam

Weathered bedrock:

36 to 45 inches, multicolored gneiss

Permeability is moderately rapid in the Edneyville and Chestnut soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and medium in areas without forest litter. The depth to weathered bedrock is more than 60 inches in the Edneyville soil and 20 to 40 inches in the Chestnut soil. The organic matter content in the surface layer ranges from low to high. Stones on the surface interfere with tillage. If the large stones are removed, the surface layer is friable and easily tilled throughout a fairly wide range in moisture content.

Included in mapping are small areas of Cowee, Evard, and Plott soils. Cowee and Evard soils have more clay in the subsoil than the Edneyville and Chestnut soils, and Plott soils have a darker surface layer. Cowee and Evard soils are on south- to west-facing slopes. Plott soils are in saddles. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Edneyville and Chestnut soils but have a redder subsoil or fewer stones on the surface.

Much of the acreage in this map unit is used as woodland. Other uses include pasture, row crops, specialty crops, building site development, and recreational activities. In the southern part of the county, high summer rainfall compensates for the droughtiness of these soils and increases productivity.

This map unit is well suited to woodland. It commonly is used for timber production on National Forest lands and can be logged year-round. Privately owned areas are rarely used for timber production because of the small size of the areas and the higher profits from building site development. This soil produces a lower volume of timber and has fewer valuable species than highly productive soils, such as Plott soils. Because this unit commonly occurs as small areas, it is generally managed with the surrounding side slopes. The slope and the hazard of erosion are management concerns.

The most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, pitch pine, and hickory. Windblown seeds from such species as yellow-poplar, black locust, red maple, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good and hardwood seedlings are available. Reforestation of hardwoods occurs dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. This map unit is droughty. White pine is commonly planted where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

This map unit is well suited to pasture and hay. The slope, stones, and the hazard of erosion are management concerns. Most of the large stones are removed when sod is established. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Cool season grasses, such as tall fescue and orchardgrass, can provide late season pasture. Keeping the pasture and hayland in good condition can help to control erosion.

This map unit is only moderately suited to row crops because of the hazard of erosion. The slope and stones also are management concerns. Most of the large stones are removed when areas of this unit are converted to cropland. Cabbage is the most common crop. A small acreage is used for broccoli. Erosion is difficult to control in areas where cabbage is grown because of the slope, the high rainfall, and the limited ground cover provided by the cabbage. Conservation practices, such as contour rows and diversions, can help to control erosion and runoff. Grassed field borders and grassed waterways can divert water safely around row crops. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat.

This map unit is only moderately suited to specialty crops, such as landscaping plants and Christmas trees. The slope, stones, and the hazard of erosion also are management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, and rhododendron. Fraser fir is grown for use as Christmas trees. Most of the large stones are removed when areas of this unit are converted to production of specialty crops. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff. Mulch can be used to help control erosion where the soils are cultivated and sod cannot be used.

This map unit is only moderately suited to building site development because of the slope and the depth to bedrock. It commonly is used for this purpose. Stones and the hazard of erosion are management concerns. Revegetating disturbed areas is difficult, mostly because of freezing and thawing. Excavation for dwellings with basements may be hampered by the depth to bedrock in the Chestnut soil. In some areas the Chestnut soil is too shallow to be used as a site for septic tank absorption fields. This map unit is in areas where the amount of annual rainfall exceeds 70 inches. Revegetating building sites as soon as possible helps to control erosion in these areas.

This map unit is only moderately suited to recreational uses, such as camp sites, because of the slope. Stones and the hazard of erosion also are management concerns. Freezing and thawing increase the need for trail maintenance on south- to west-facing slopes. Water sources, such as springs, are not generally available in areas of this unit.

This map unit is only moderately suited to access roads because of the slope and frost action. It commonly is used for this purpose because timber production and building site development are important uses. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality, Revegetating areas that have been cut and filled is difficult, especially on south- to west-facing slopes that freeze and thaw in spring and fall. Hydroseeding is a good way to revegetate roadbanks.

The capability subclass is IVe. Based on northern red oak as the indicator species, the woodland ordination symbol is 4A in areas of the Edneyville soil and 4D in areas of the Chestnut soil.

EdD—Edneyville-Chestnut complex, 15 to 30 percent slopes, stony. This moderately steep map unit consists mainly of a very deep, well drained Edneyville soil and a moderately deep, well drained Chestnut soil. The unit is on side slopes and ridgetops in the intermediate mountains. Scattered stones and boulders are on the surface. Individual areas are irregular in shape and range from 5 to 40 acres in size. Typically, they are 40 to 50 percent Edneyville soil and 30 to 40 percent Chestnut soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Edneyville soil are as follows—

Surface layer:
0 to 5 inches, dark yellowish brown fine sandy loam

Subsoil:
5 to 12 inches, strong brown loam
12 to 39 inches, strong brown fine sandy loam
39 to 43 inches, mottled yellowish brown, strong brown, and light yellowish brown fine sandy loam

Underlying material:
43 to 51 inches, mottled yellowish brown, yellowish red, and very pale brown sandy loam
51 to 64 inches, gray, black, and white sandy loam

The typical sequence, depth, and composition of the layers of the Chestnut soil are as follows—

Surface layer:
0 to 5 inches, dark brown gravelly fine sandy loam
5 to 10 inches, dark yellowish brown gravelly fine sandy loam

Subsoil:
10 to 24 inches, dark yellowish brown gravelly fine sandy loam

Underlying material:
24 to 36 inches, multicolored cobbly fine sandy loam

Weathered bedrock:
36 to 45 inches, multicolored gneiss

Permeability is moderately rapid in the Edneyville and Chestnut soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to weathered bedrock is more than 60 inches in the Edneyville soil and 20 to 40 inches in the Chestnut soil. The organic matter content in the surface layer ranges from low to high. Stones on the surface interfere with tillage. If the large stones are removed, the surface layer is friable and easily tilled throughout a fairly wide range in moisture content.

Included in mapping are small areas of Cleveland, Cowee, Evard, and Plott soils. Cleveland soils are shallow over bedrock. Cowee and Evard soils have more clay in the subsoil than the Edneyville and Chestnut soils, and Plott soils have a darker surface layer. Cleveland soils are around small areas of rock outcrop. Cowee and Evard soils are on south- to west-facing slopes. Plott soils are in saddles and on foot slopes. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Edneyville and Chestnut soils but have a redder subsoil or fewer stones on the surface.

Much of the acreage in this map unit is used as woodland. Other uses include pasture, specialty crops, building site development, recreational activities, and row crops. In the southern part of the county, high summer rainfall compensates for the droughtiness of these soils and increases productivity.

This map unit is only moderately suited to woodland because of the slope. The hazard of erosion and an equipment limitation are moderate management concerns. This unit commonly is used for timber production on National Forest lands and can be logged year-round. Privately owned areas are rarely used for timber production because of the higher profits from building site development. These soils produce a lower volume of timber and have fewer valuable species than highly productive soils, such as Plott soils. The most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, pitch pine, and hickory. Windblown seeds from such species as yellow-poplar, black locust, red maple, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good and hardwood seedlings are available. Reforestation of hardwoods occurs dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. This map unit is droughty. White pine is commonly planted where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

This map unit is only moderately suited to pasture because of the slope. Stones and the hazard of erosion also are management concerns. Most of the large stones are removed when sod is established. Operating farm equipment is difficult because of the slope. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Cool season grasses, such as tall fescue and orchardgrass, can provide late season pasture. Keeping the pasture in good condition can help to control erosion.

This map unit is poorly suited to specialty crops,

such as landscaping plants and Christmas trees, because of the slope. Stones and the hazard of erosion also are management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, and rhododendron. Fraser fir is grown for use as Christmas trees. Most of the large stones are removed when areas of this unit are converted to production of specialty crops. Operating farm equipment is difficult because of the slope. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff.

This map unit is poorly suited to building site development because of the slope and the depth to bedrock but commonly is used for this purpose. Stones and the hazard of erosion also are management concerns. Revegetating disturbed areas is difficult because of the slope and freezing and thawing. Hydroseeding is a good way to revegetate steep banks. Excavation for dwellings with basements may be hampered by the depth to bedrock in the Chestnut soil. In some areas the Chestnut soil is too shallow to be used as a site for septic tank absorption fields. This map unit is in areas where the amount of annual rainfall exceeds 70 inches. Revegetating building sites as soon as possible helps to control erosion in these areas.

This map unit is only moderately suited to recreational uses, such as overlooks and hiking trails, because of the slope. Stones and the hazard of erosion also are management concerns. Freezing and thawing increase the need for trail maintenance on south- to west-facing slopes.

This map unit is poorly suited to row crops because of the hazard of erosion. The slope and stones also are management concerns. Most of the large stones are removed when areas of this unit are converted to cropland. Cabbage is the most common crop. Erosion is difficult to control in areas where cabbage is grown because of the slope, the high rainfall, and the limited ground cover provided by the cabbage. Conservation practices, such as contour rows and diversions, can help to control erosion and runoff. Grassed field borders and grassed waterways can divert water safely around row crops. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat.

This map unit is poorly suited to access roads because of the slope. It commonly is used for this purpose, however, because timber production and building site development are important uses. Building the roadbed on natural soil minimizes slumping. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating areas that have been cut and filled is difficult because of the slope, especially on south- to west-facing slopes that freeze and thaw in spring and fall. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIe. Based on northern red oak as the indicator species, the woodland ordination symbol is 4R.

EdE—Edneyville-Chestnut complex, 30 to 50 percent slopes, stony. This steep map unit consists mainly of a very deep, well drained Edneyville soil and a moderately deep, well drained Chestnut soil. The unit is on side slopes and narrow ridgetops in the intermediate mountains. Scattered stones and boulders are on the surface. Individual areas are irregular in shape and range from 10 to 150 acres in size. Typically, they are 50 to 60 percent Edneyville soil and 20 to 30 percent Chestnut soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Edneyville soil are as follows—

Surface layer:
0 to 5 inches, dark yellowish brown fine sandy loam

Subsoil:
5 to 12 inches, strong brown loam
12 to 39 inches, strong brown fine sandy loam
39 to 43 inches, mottled yellowish brown, strong brown, and light yellowish brown fine sandy loam

Underlying material:
43 to 51 inches, mottled yellowish brown, yellowish red, and very pale brown sandy loam
51 to 64 inches, gray, black, and white sandy loam

The typical sequence, depth, and composition of the layers of the Chestnut soil are as follows—

Surface layer:
0 to 5 inches, dark brown gravelly fine sandy loam
5 to 10 inches, dark yellowish brown gravelly fine sandy loam

Subsoil:
10 to 24 inches, dark yellowish brown gravelly fine sandy loam

Underlying material:
24 to 36 inches, multicolored cobbly fine sandy loam

Weathered bedrock:
36 to 45 inches, multicolored gneiss

Permeability is moderately rapid in the Edneyville and Chestnut soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and

rapid or very rapid in areas without forest litter. The depth to weathered bedrock is more than 60 inches in the Edneyville soil and 20 to 40 inches in the Chestnut soil. The organic matter content in the surface layer ranges from low to high.

Included in mapping are small areas of Cleveland, Cowee, Cullasaja, Evard, Plott, and Tuckasegee soils. Cleveland soils are shallow over bedrock. Cowee and Evard soils have more clay in the subsoil than the Edneyville and Chestnut soils; and Cullasaja, Plott, and Tuckasegee soils have a darker surface layer. Also, Cullasaja soils have more than 35 percent rock fragments in the subsoil. Cleveland soils are around small areas of rock outcrop. Cowee and Evard soils are on south- to west-facing slopes. Plott soils are in saddles and on foot slopes. Cullasaja and Tuckasegee soils are in drainageways. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Edneyville and Chestnut soils but have a redder subsoil or fewer stones on the surface.

Much of the acreage in this map unit is used as woodland. Other uses include pasture, building site development, specialty crops, and recreational activities.

This map unit is poorly suited to woodland because of the slope. The hazard of erosion and an equipment limitation are severe management concerns. Soil compaction also is a management concern. These soils produce a lower volume of timber and have fewer valuable species than highly productive soils, such as Plott soils. This unit commonly is used for timber production on National Forest lands and can be logged year-round. Privately owned areas are rarely used for timber production because of the higher profits from building site development. The most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, pitch pine, Virginia pine, and hickory. Windblown seeds from such species as yellow-poplar, black locust, red maple, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good and hardwood seedlings are available. Reforestation of hardwoods occurs dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. This map unit is droughty. White pine is commonly planted where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

This map unit is poorly suited to pasture because of the slope. Stones and the hazard of erosion also are management concerns. Most of the large stones are removed when sod is established. Operating farm equipment is dangerous because of the slope. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Generally, weeds are controlled and fertilizer and lime are applied by hand. Cool season grasses, such as tall fescue and orchardgrass, can provide late season pasture. Keeping the pasture in good condition can help to control erosion.

This map unit is poorly suited to specialty crops because of the slope but is used for landscaping plants and Christmas trees. Stones and the hazard of erosion also are management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, and rhododendron. Fraser fir is grown for use as Christmas trees. Most of the large stones are removed when areas of this unit are converted to production of specialty crops. Operating farm equipment is dangerous because of the slope. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff.

This map unit is poorly suited to building site development because of the slope and the depth to bedrock but commonly is used for this purpose. Stones and the hazard of erosion also are management concerns. Revegetating disturbed areas is difficult because of the slope and freezing and thawing. Hydroseeding is a good way to revegetate steep banks. Excavation for dwellings with basements may be hampered by the depth to bedrock in the Chestnut soil. Septic tank absorption fields should be dug by hand because of the slope. In some areas the Chestnut soil is too shallow to be used as a site for septic tank absorption fields.

This map unit is poorly suited to recreational uses because of the slope but in some areas is used for overlooks and hiking trails. Stones and the hazard of erosion also are management concerns. Freezing and thawing increase the need for trail maintenance on south- to west-facing slopes.

This map unit is not used for crops. The slope and the hazard of erosion are management concerns.

This map unit is poorly suited to access roads because of the slope. It commonly is used for this

purpose, however, because timber production and building site development are important uses. Building the roadbed on natural soil minimizes slumping. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating large areas that have been cut and filled is difficult because of the slope, especially on south- to west-facing slopes that freeze and thaw in spring and fall. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIIe. Based on northern red oak as the indicator species, the woodland ordination symbol is 4R.

EdF—Edneyville-Chestnut complex, 50 to 95 percent slopes, stony. This very steep map unit consists mainly of a very deep, well drained Edneyville soil and a moderately deep, well drained Chestnut soil. The unit is on side slopes in the intermediate mountains. Scattered stones and boulders are on the surface. Individual areas are irregular in shape and range from 20 to 200 acres in size. Typically, they are 40 to 50 percent Edneyville soil and 30 to 40 percent Chestnut soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Edneyville soil are as follows—

Surface layer:
0 to 5 inches, dark yellowish brown fine sandy loam

Subsoil:
5 to 12 inches, strong brown loam
12 to 39 inches, strong brown fine sandy loam
39 to 43 inches, mottled yellowish brown, strong brown, and light yellowish brown fine sandy loam

Underlying material:
43 to 51 inches, mottled yellowish brown, yellowish red, and very pale brown sandy loam
51 to 64 inches, gray, black, and white sandy loam

The typical sequence, depth, and composition of the layers of the Chestnut soil are as follows—

Surface layer:
0 to 5 inches, dark brown gravelly fine sandy loam
5 to 10 inches, dark yellowish brown gravelly fine sandy loam

Subsoil:
10 to 24 inches, dark yellowish brown gravelly fine sandy loam

Underlying material:
24 to 36 inches, multicolored cobbly fine sandy loam

Weathered bedrock:
36 to 45 inches, multicolored gneiss

Permeability is moderately rapid in the Edneyville and Chestnut soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid or very rapid in areas without forest litter. The depth to weathered bedrock is more than 60 inches in the Edneyville soil and 20 to 40 inches in the Chestnut soil. The organic matter content in the surface layer ranges from low to high.

Included in mapping are small areas of Cleveland, Cowee, Cullasaja, Evard, Plott, and Tuckasegee soils. Cleveland soils are shallow over bedrock. Cowee and Evard soils have more clay in the subsoil than the Edneyville and Chestnut soils; and Cullasaja, Plott, and Tuckasegee soils have a darker surface layer. Also, Cullasaja soils have more than 35 percent rock fragments in the subsoil. Cleveland soils are around small areas of rock outcrop. Cowee and Evard soils are on south- to west-facing slopes. Plott soils are in saddles and on foot slopes. Cullasaja and Tuckasegee soils are in drainageways. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Edneyville and Chestnut soils but have a redder subsoil or fewer stones on the surface.

Nearly all of the acreage in this map unit is used as woodland.

This map unit is poorly suited to woodland because of the slope. The hazard of erosion and an equipment limitation are severe management concerns. These soils produce a lower volume of timber and have fewer valuable species than highly productive soils, such as Plott soils. This unit commonly is used for timber production on National Forest lands. The most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, and hickory. Windblown seeds from such species as yellow-poplar, black locust, red maple, pitch pine, Virginia pine, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good and hardwood seedlings are available. Reforestation of hardwoods occurs dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. It is commonly planted where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine.

Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

This map unit is logged year-round by the U.S. Forest Service. The slope restricts the kinds of equipment that can be used. Operating wheeled or tracked equipment is dangerous because of the slope. Cable yarding is safer, disturbs the soil less, and maintains the productivity of the soil.

This map unit is poorly suited to recreational uses because of the slope but is used for hiking trails. Stones and the hazard of erosion also are management concerns. Freezing and thawing increase the need for trail maintenance on south- to west-facing slopes.

This map unit is not used for pasture, building site development, or crops. The slope is the main management concern. Stones and the hazard of erosion also are management concerns.

This map unit is poorly suited to access roads because of the slope. It commonly is used for this purpose, however, because timber production is an important use. Building and maintaining the roads are difficult and expensive. Building the roadbed on natural soil minimizes slumping. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating large areas that have been cut and filled is difficult, especially on south- to west-facing slopes that freeze and thaw in spring and fall. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIIe. Based on northern red oak as the indicator species, the woodland ordination symbol is 4R.

EeC—Edneyville-Chestnut-Urban land complex, 2 to 15 percent slopes. This gently sloping to strongly sloping map unit occurs mainly as areas of a very deep, well drained Edneyville soil; a moderately deep, well drained Chestnut soil; and Urban land. The unit is on ridgetops in the intermediate mountains. Most areas of the unit are in or near the town of Highlands. Individual areas range from 5 to 40 acres in size. Typically, they are 15 to 25 percent Edneyville soil, 15 to 25 percent Chestnut soil, and 15 to 25 percent Urban land. The two soils and Urban land occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Edneyville soil are as follows—

Surface layer:
0 to 5 inches, dark yellowish brown fine sandy loam

Subsoil:
5 to 12 inches, strong brown loam
12 to 39 inches, strong brown fine sandy loam
39 to 43 inches, mottled yellowish brown, strong brown, and light yellowish brown fine sandy loam

Underlying material:
43 to 51 inches, mottled yellowish brown, yellowish red, and very pale brown sandy loam
51 to 64 inches, gray, black, and white sandy loam

The typical sequence, depth, and composition of the layers of the Chestnut soil are as follows—

Surface layer:
0 to 5 inches, dark brown gravelly fine sandy loam
5 to 10 inches, dark yellowish brown gravelly fine sandy loam

Subsoil:
10 to 24 inches, dark yellowish brown gravelly fine sandy loam

Underlying material:
24 to 36 inches, multicolored cobbly fine sandy loam

Weathered bedrock:
36 to 45 inches, multicolored gneiss

Urban land consists of impervious areas that are covered with buildings, streets, sidewalks, driveways, and parking lots.

Permeability is moderately rapid in the Edneyville and Chestnut soils. The depth to weathered bedrock is more than 60 inches in the Edneyville soil and 20 to 40 inches in the Chestnut soil. The organic matter content in the surface layer ranges from low to high. Surface runoff is rapid because of the large amount of impervious Urban land and a sparse plant cover on the Edneyville and Chestnut soils. Runoff is particularly heavy during intense rain storms. Channel flow is common during storms.

Included in mapping are areas where some or all of the natural soil has been altered or covered as a result of grading and digging. Around many commercial buildings, grading, cutting, and filling have been extensive. Around some homes the disturbance is largely in the form of soil compaction. Also included are small areas of Cleveland, Sylva, Tuckasegee, and Whiteside soils. Cleveland soils are shallow over bedrock. Sylva soils are poorly drained. Tuckasegee soils have a darker surface layer than that of the Edneyville and Chestnut soils. Whiteside soils are moderately well drained. Cleveland soils are around small areas of rock outcrop. Sylva, Tuckasegee, and Whiteside soils are in depressions and on toe slopes.

Contrasting inclusions make up about 20 percent of this map unit.

Areas of this unit near the town of Highlands are rapidly being developed. The Edneyville and Chestnut soils are only moderately suited to building site development and access roads because of the slope and the depth to bedrock. Erosion is a hazard. Runoff causes severe erosion if the soils are not protected. Erosion-control practices are needed to control pollution caused by sediments, decrease the runoff rate, and reduce the hazard of flooding in lower areas. Vegetation is difficult to establish in some areas. Excavation for dwellings with basements may be hampered by the depth to bedrock in the Chestnut soil. In some areas the Chestnut soil is too shallow to be used as a site for septic tank absorption fields.

The capability subclass is IVe in areas of the Edneyville and Chestnut soils and VIIIs in areas of the Urban land. This map unit has not been assigned a woodland ordination symbol.

EeD—Edneyville-Chestnut-Urban land complex, 15 to 30 percent slopes. This moderately steep map unit occurs mainly as areas of a very deep, well drained Edneyville soil; a moderately deep, well drained Chestnut soil; and Urban land. The unit is on ridgetops in the intermediate mountains. Most areas of the unit are in or near the town of Highlands. Individual areas range from 5 to 40 acres in size. Typically, they are 15 to 25 percent Edneyville soil, 15 to 25 percent Chestnut soil, and 15 to 25 percent Urban land. The two soils and Urban land occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Edneyville soil are as follows—

Surface layer:
0 to 5 inches, dark yellowish brown fine sandy loam

Subsoil:
5 to 12 inches, strong brown loam
12 to 39 inches, strong brown fine sandy loam
39 to 43 inches, mottled yellowish brown, strong brown, and light yellowish brown fine sandy loam

Underlying material:
43 to 51 inches, mottled yellowish brown, yellowish red, and very pale brown sandy loam
51 to 64 inches, gray, black, and white sandy loam

The typical sequence, depth, and composition of the layers of the Chestnut soil are as follows—

Surface layer:
0 to 5 inches, dark brown gravelly fine sandy loam
5 to 10 inches, dark yellowish brown gravelly fine sandy loam

Subsoil:
10 to 24 inches, dark yellowish brown gravelly fine sandy loam

Underlying material:
24 to 36 inches, multicolored cobbly fine sandy loam

Weathered bedrock:
36 to 45 inches, multicolored gneiss

Urban land consists of impervious areas that are covered with buildings, streets, sidewalks, driveways, and parking lots.

Permeability is moderately rapid in the Edneyville and Chestnut soils. The depth to weathered bedrock is more than 60 inches in the Edneyville soil and 20 to 40 inches in the Chestnut soil. The organic matter content in the surface layer ranges from low to high. Surface runoff is very rapid because of the large amount of impervious Urban land and a sparse plant cover on the Edneyville and Chestnut soils. Runoff is particularly heavy during intense rain storms. Channel flow is common during storms.

Included in mapping are areas where some or all of the natural soil has been altered or covered as a result of grading and digging. Around many commercial buildings, grading, cutting, and filling have been extensive. Around some homes the disturbance is largely in the form of soil compaction. Also included are small areas of Cleveland, Cowee, Evard, and Plott soils. Cleveland soils are shallow over bedrock. Cowee and Evard soils have more clay in the subsoil than the Edneyville and Chestnut soils, and Plott soils have a darker surface layer. Cleveland soils are around small areas of rock outcrop. Cowee and Evard soils are on south- to west-facing slopes. Plott soils are in saddles and on foot slopes. Contrasting inclusions make up about 20 percent of this map unit.

Areas of this unit near the town of Highlands are rapidly being developed. The Edneyville and Chestnut soil are poorly suited to building site development and access roads because of the slope and the depth to bedrock. Erosion is a hazard. Runoff causes severe erosion if the soils are not protected. Erosion-control practices are needed to control pollution caused by sediments, decrease the runoff rate, and reduce the hazard of flooding in lower areas. Vegetation is difficult to establish in some areas. Excavation for dwellings may be hampered by the depth to bedrock in the Chestnut soil. In some areas the Chestnut soil is too shallow to be used as a site for septic tank absorption fields.

The capability subclass is VIe in areas of the Edneyville and Chestnut soils and VIIIs in areas of the Urban land. This map unit has not been assigned a woodland ordination symbol.

EvB—Evard-Cowee complex, 2 to 8 percent slopes. This gently sloping map unit consists mainly of a very deep, well drained Evard soil and a moderately deep, well drained Cowee soil. The unit is on moderately broad ridgetops in the low mountains. Individual areas range from 2 to 20 acres in size. Typically, they are 50 to 60 percent Evard soil and 20 to 30 percent Cowee soil. The two soils occur as areas too intricately mixed and too small to be mapped separately.

The typical sequence, depth, and composition of the layers of the Evard soil are as follows—

Surface layer:
0 to 5 inches, brown fine sandy loam

Subsoil:
5 to 8 inches, strong brown loam
8 to 23 inches, yellowish red sandy clay loam
23 to 35 inches, red sandy clay loam
35 to 45 inches, red fine sandy loam

Underlying material:
45 to 61 inches, multicolored sandy loam

Weathered bedrock:
61 to 66 inches, multicolored mica gneiss

The typical sequence, depth, and composition of the layers of the Cowee soil are as follows—

Surface layer:
0 to 10 inches, brown sandy loam

Subsoil:
10 to 27 inches, red clay loam

Underlying material:
27 to 38 inches, multicolored gravelly sandy loam

Weathered bedrock:
38 to 45 inches, multicolored gneiss

Permeability is moderate in the Evard and Cowee soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to weathered bedrock is more than 60 inches in the Evard soil and 20 to 40 inches in the Cowee soil. The organic matter content in the surface layer is low to high.

Included in mapping are small areas of Chestnut, Edneyville, and Hayesville soils. Chestnut and Edneyville soils have less clay in the subsoil than the Evard and Cowee soils. Hayesville soils have a clayey subsoil. Chestnut and Edneyville soils are on north- to east-facing slopes. Hayesville soils are in the less sloping areas. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Evard and Cowee soils but have a browner subsoil or more stones on the surface.

Much of the acreage in this map unit is used as pasture or hayland. Other uses include woodland, specialty crops, and building site development.

This map unit is well suited to pasture and hay. The slope and the hazard of erosion are management concerns. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Keeping the pasture and hayland in good condition can help to control erosion.

This map unit is well suited to woodland. It is rarely used for timber production, however, because of the small size of the areas and the higher profits from crops, building site development, pasture, and hayland. The slope and the hazard of erosion are management concerns. This map unit produces a lower volume of timber and has fewer valuable species than highly productive soils, such as Trimont soils. Because this unit commonly occurs as small areas, it is generally managed with the surrounding timber stands. The most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, pitch pine, Virginia pine, and hickory. Windblown seeds from such species as black locust, red maple, pitch pine, Virginia pine, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good. Hardwood seedlings are favored on sites where the amount of annual rainfall is more than 60 inches. Reforestation of hardwoods occurs dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. It is commonly planted where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

Care is needed to prevent soil compaction. The use of heavy equipment should be restricted to dry periods. When the soils are wet, skid trails and unsurfaced roads are soft and slick because of a high content of clay.

This map unit is only moderately suited to specialty crops, such as landscaping plants and Christmas trees, but is well suited to apples. Trees and other plants take longer to grow on these soils than on highly productive soils, such as Saunook soils. The slope and the hazard of erosion are management concerns. The most common landscaping plants are Norway spruce, mountain laurel, and rhododendron. White pine is grown for use as Christmas trees. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff.

This map unit is only moderately suited to building site development because of caving of cutbanks and the depth to bedrock. It commonly is used for this purpose because it is one of the best map units available in the county. The slope and the hazard of erosion are management concerns. Excavation for dwellings with basements may be hampered by the depth to bedrock in the Cowee soil and by caving of cutbanks in areas of the Evard soil. In some areas the Cowee soil is too shallow to be used as a site for septic tank absorption fields.

This map unit is well suited to recreational uses, such as camp sites and picnic areas. It is rarely used for these purposes, however, because it is not near streams. The slope and the hazard of erosion are management concerns.

This map unit is rarely used for row crops because of low yields. The slope and the hazard of erosion are management concerns.

This map unit is only moderately suited to access roads because of frost action. It commonly is used for this purpose because building site development is an important use. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating disturbed areas is difficult, especially on south- to west-facing slopes that freeze and thaw in spring and fall.

The capability subclass is IIe in areas of the Evard soil and IIIe in areas of the Cowee soil. Based on chestnut oak as the indicator species, the woodland ordination symbol is 4A in areas of the Evard soil and 3D in areas of the Cowee soil.

EvC—Evard-Cowee complex, 8 to 15 percent slopes. This strongly sloping map unit consists mainly of a very deep, well drained Evard soil and a moderately deep, well drained Cowee soil. The unit is on ridgetops in the low mountains. Individual areas range 5 to 40 acres in size. Typically, they are 50 to 60 percent Evard soil and 20 to 30 percent Cowee soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Evard soil are as follows—

Surface layer:
0 to 5 inches, brown fine sandy loam

Subsoil:
5 to 8 inches, strong brown loam
8 to 23 inches, yellowish red sandy clay loam
23 to 35 inches, red sandy clay loam
35 to 45 inches, red fine sandy loam

Underlying material:
45 to 61 inches, multicolored sandy loam

Weathered bedrock:
61 to 66 inches, multicolored mica gneiss

The typical sequence, depth, and composition of the layers of the Cowee soil are as follows—

Surface layer:
0 to 10 inches, brown sandy loam

Subsoil:
10 to 27 inches, red clay loam

Underlying material:
27 to 38 inches, multicolored gravelly sandy loam

Weathered bedrock:
38 to 45 inches, multicolored gneiss

Permeability is moderate in the Evard and Cowee soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to weathered bedrock is more than 60 inches in the Evard soil and 20 to 40 inches in the Cowee soil. The organic matter content in the surface layer ranges from low to high.

Included in mapping are small areas of Chestnut, Edneyville, and Saunook soils. Chestnut and Edneyville soils have less clay in the subsoil than the Evard and Cowee soils, and Saunook soils have a darker surface layer. Chestnut and Edneyville soils are on north- to east-facing slopes. Saunook soils are in drainageways. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Evard and Cowee soils but have a browner subsoil or more stones on the surface.

Much of the acreage in this map unit is used as pasture or hayland. Other uses include woodland, specialty crops, and building site development.

This map unit is well suited to pasture and hay. The slope and the hazard of erosion are management concerns. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Keeping the pasture and hayland in

good condition can help to control erosion.

This map unit is well suited to woodland. It commonly is used for timber production on National Forest lands. Privately owned areas are rarely used for timber production because of the small size of the areas and the higher profits from building site development. These soils produce a lower volume of timber and have fewer valuable species than highly productive soils, such as Trimont soils. Because this unit commonly occurs as small areas, it is generally managed with the surrounding side slopes. The slope, compaction, and the hazard of erosion are management concerns. The most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, pitch pine, Virginia pine, and hickory. Windblown seeds from such species as black locust, red maple, pitch pine, Virginia pine, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good. Hardwood seedlings are preferred on sites where the amount of annual rainfall is more than 60 inches. Reforestation of hardwoods occurs dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. It is commonly planted where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

Care is needed to prevent soil compaction. The use of heavy equipment should be restricted to dry periods. When the soils are wet, skid trails and unsurfaced roads are soft and slick because of a high content of clay.

This map unit is only moderately suited to specialty crops, such as landscaping plants and Christmas trees, because of the slope but is well suited to apples. Trees and other plants take longer to grow on these soils than on highly productive soils, such as Saunook soils. Erosion is a hazard. The most common landscaping plants are Norway spruce, mountain laurel, and rhododendron. White pine is grown for use as Christmas trees. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff.

This map unit is only moderately suited to building site development because of the slope, caving of cutbanks, and the depth to bedrock. It commonly is used for this purpose because it is one of the best map units available in the county. Erosion is a hazard. Excavation for dwellings with basements may be hampered by the depth to bedrock in the Cowee soil and by caving of cutbanks in areas of the Evard soil. In some areas the Cowee soil is too shallow to be used as a site for septic tank absorption fields.

This map unit is only moderately suited to recreational uses, such as camp sites and picnic areas, because of the slope. It is rarely used for these purposes because it is not near streams. Erosion is a hazard.

This map unit is rarely used for row crops because of low yields. The slope and the hazard of erosion are management concerns.

This map unit is only moderately suited to access roads because of the slope and frost action. It commonly is used for this purpose because timber production and building site development are important uses. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating areas that have been cut and filled is difficult, especially on south- to west-facing slopes that freeze and thaw in spring and fall.

The capability subclass is IVe. Based on shortleaf pine as the indicator species, the woodland ordination symbol is 8A in areas of the Evard soil. Based on chestnut oak as the indicator species, the woodland ordination symbol 3D in areas of the Cowee soil.

EvD—Evard-Cowee complex, 15 to 30 percent slopes. This moderately steep map unit consists mainly of a very deep, well drained Evard soil and a moderately deep, well drained Cowee soil. The unit is on side slopes and ridgetops in the low mountains. Individual areas range from 5 to 60 acres in size. Typically, they are 50 to 60 percent Evard soil and 20 to 30 percent Cowee soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Evard soil are as follows—

Surface layer:
0 to 5 inches, brown fine sandy loam

Subsoil:
5 to 8 inches, strong brown loam
8 to 23 inches, yellowish red sandy clay loam
23 to 35 inches, red sandy clay loam
35 to 45 inches, red fine sandy loam

Underlying material:
45 to 61 inches, multicolored sandy loam

Weathered bedrock:
61 to 66 inches, multicolored mica gneiss

The typical sequence, depth, and composition of the layers of the Cowee soil are as follows—

Surface layer:
0 to 10 inches, brown sandy loam

Subsoil:
10 to 27 inches, red clay loam

Underlying material:
27 to 38 inches, multicolored gravelly sandy loam

Weathered bedrock:
38 to 45 inches, multicolored gneiss

Permeability is moderate in the Evard and Cowee soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to weathered bedrock is more than 60 inches in the Evard soil and 20 to 40 inches in the Cowee soil. The organic matter content in the surface layer ranges from low to high.

Included in mapping are small areas of Chestnut, Edneyville, Saunook, and Trimont soils. Chestnut and Edneyville soils have less clay in the subsoil than the Evard and Cowee soils, and Saunook and Trimont soils have a darker surface layer. Chestnut, Edneyville, and Trimont soils are on north- to east-facing slopes. Saunook soils are in drainageways. Also included are small areas of rock outcrop. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Evard and Cowee soils but have a browner subsoil or more stones on the surface.

Much of the acreage in this map unit is used as woodland. Other uses include pasture, building site development, specialty crops, and recreational activities.

This map unit is only moderately suited to woodland because of the slope. The hazard of erosion and an equipment limitation are moderate management concerns. Soil compaction also is a management concern. This unit commonly is used for timber production on National Forest lands. Privately owned areas are rarely used for timber production because of the higher profits from building site development. These soils produce a lower volume of timber and have fewer valuable species than highly productive soils, such as Trimont soils. The most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, pitch pine, Virginia pine, and hickory. Windblown seeds from such species as black locust, red maple, pitch pine, Virginia pine, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good. Hardwood seedlings are preferred on sites where the amount of annual rainfall is more than 60 inches. Reforestation of hardwoods occurs dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. It is commonly planted where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

Care is needed to prevent soil compaction. The use of heavy equipment should be restricted to dry periods. When the soils are wet, skid trails and unsurfaced roads are soft and slick because of a high content of clay.

This map unit is only moderately suited to pasture because of the slope. The hazard of erosion also is a management concern. Operating farm equipment is difficult because of the slope. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Keeping the pasture in good condition can help to control erosion.

This map unit is poorly suited to building site development because of the slope, caving of cutbanks, and the depth to bedrock but commonly is used for this purpose. The hazard of erosion also is a management concern. Revegetating disturbed areas is difficult because of the slope and freezing and thawing. Hydroseeding is a good way to revegetate steep banks. Excavation for dwellings with basements may be hampered by the depth to bedrock in the Cowee soil and by caving of cutbanks in areas of the Evard soil. In some areas the Cowee soil is too shallow to be used as a site for septic tank absorption fields.

This map unit is poorly suited to specialty crops, such as apples, landscaping plants, and Christmas trees, because of the slope. Most of the apples grown in the county, however, are grown in areas of this unit (fig. 6). Erosion is a hazard. The most common landscaping plants are Norway spruce, mountain laurel, and rhododendron. White pine is grown for use as Christmas trees. Fraser fir is grown on foot slopes. The production of Fraser fir requires careful site selection and management because of droughtiness and the clay content. Operating farm equipment is difficult because of the slope. Establishing and maintaining sod in areas

Figure 6.—An apple orchard in an area of Evard-Cowee complex, 15 to 30 percent slopes.

that are not used for crops minimize erosion and help to control runoff.

This map unit is only moderately suited to recreational uses, such as overlooks and hiking trails, because of the slope. The hazard of erosion also is a management concern. Freezing and thawing increase the need for trail maintenance on south- to west-facing slopes.

This map unit is not used for row crops. The slope and the hazard of erosion are management concerns.

This map unit is poorly suited to access roads because of the slope. It commonly is used for this purpose, however, because timber production and building site development are important uses. When the soils are wet, unsurfaced roads are soft and slick. Roads require surfacing for year-round use because gravel continuously sinks into the subsoil. Building the roadbed on natural soil minimizes slumping. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating areas that have been cut and filled is difficult, especially on south- to west-facing slopes that freeze and thaw in spring and fall. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIe. Based on chestnut oak as the indicator species, the woodland ordination symbol is 4R in areas of the Evard soil and 3R in areas of the Cowee soil.

EvE—Evard-Cowee complex, 30 to 50 percent slopes. This steep map unit consists mainly of a very deep, well drained Evard soil and a moderately deep, well drained Cowee soil. The unit is on side slopes and narrow ridgetops in the low mountains. Individual areas range from 10 to 150 acres in size. Typically, they are 50 to 60 percent Evard soil and 20 to 30 percent Cowee soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Evard soil are as follows—

Surface layer:
0 to 5 inches, brown fine sandy loam

Subsoil:
5 to 8 inches, strong brown loam
8 to 23 inches, yellowish red sandy clay loam
23 to 35 inches, red sandy clay loam
35 to 45 inches, red fine sandy loam

Underlying material:
45 to 61 inches, multicolored sandy loam

Weathered bedrock:
61 to 66 inches, multicolored mica gneiss

The typical sequence, depth, and composition of the layers of the Cowee soil are as follows—

Surface layer:
0 to 10 inches, brown sandy loam

Subsoil:
10 to 27 inches, red clay loam

Underlying material:
27 to 38 inches, multicolored gravelly sandy loam

Weathered bedrock:
38 to 45 inches, multicolored gneiss

Permeability is moderate in the Evard and Cowee soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to weathered bedrock is more than 60 inches in the Evard soil and 20 to 40 inches in the Cowee soil. The organic matter content in the surface layer ranges from low to high.

Included in mapping are small areas of Chestnut, Edneyville, Saunook, and Trimont soils. Chestnut and Edneyville soils have less clay in the subsoil than the Evard and Cowee soils, and Saunook and Trimont soils have a darker surface layer. Chestnut, Edneyville, and Trimont soils are on north- to east-facing slopes. Saunook soils are in drainageways. Also included are small areas of rock outcrop. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Evard and Cowee soils but have a browner subsoil or more stones on the surface.

Much of the acreage in this map unit is used as woodland. Other uses include pasture, building site development, specialty crops, and recreational activities.

This map unit is poorly suited to woodland because of the slope. The hazard of erosion and an equipment limitation are severe management concerns. Soil compaction also is a management concern. These soils produce a lower volume of timber and have fewer valuable species than highly productive soils, such as Trimont soils. This unit commonly is used for timber production on National Forest lands. Privately owned areas are rarely used for timber production because of the higher profits from building site development. The most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, pitch pine, Virginia pine, and hickory. Windblown seeds from such species as black locust, red maple, pitch pine, Virginia pine, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good. Hardwood seedlings are preferred on sites where the amount of annual rainfall is more than 60 inches. Reforestation of hardwoods occurs dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. It is commonly planted where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

Care is needed to prevent soil compaction. The use of heavy equipment should be restricted to dry periods. When the soils are wet, skid trails and unsurfaced roads are soft and slick because of a high content of clay.

This map unit is poorly suited to pasture because of the slope. The hazard of erosion also is a management concern. Operating farm equipment is dangerous because of the slope. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Generally, weeds are controlled and fertilizer and lime are applied by hand. Keeping the pasture in good condition can help to control erosion.

This map unit is poorly suited to building site development because of the slope, caving of cutbanks, and the depth to bedrock but commonly is used for this purpose. The hazard of erosion also is a management concern. Revegetating disturbed areas is difficult because of the slope and freezing and thawing. Hydroseeding is a good way to revegetate steep banks. Excavation for dwellings with basements may be hampered by the depth to bedrock in the Cowee soil and by caving of cutbanks in areas of the Evard soil. Septic tank absorption fields should be dug by hand because of the slope. In some areas the Cowee soil is too shallow to be used as a site for septic tank absorption fields.

This map unit is poorly suited to specialty crops because of the slope, but a few areas are used for apples, landscaping plants, and Christmas trees. The slope and the hazard of erosion are the main management concerns. The most common landscaping plants are Norway spruce, mountain laurel, and rhododendron. White pine is grown for use as Christmas trees. Fraser fir is grown on foot slopes. The production of Fraser fir requires careful management because of droughtiness and the clay content. Operating farm equipment is dangerous because of the slope. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff.

This map unit is poorly suited to recreational uses because of the slope but in some areas is used for overlooks and hiking trails. The hazard of erosion also is a management concern. Freezing and thawing increase the need for trail maintenance on south- to west-facing slopes.

This map unit is not used for crops. The slope and the hazard of erosion are management concerns.

This map unit is poorly suited to access roads because of the slope. It commonly is used for this purpose, however, because timber production and building site development are important uses. When the soils are wet, unsurfaced roads are soft and slick. Roads require surfacing for year-round use because gravel continuously sinks into the subsoil. Building the roadbed on natural soil minimizes slumping. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating large areas that have been cut and filled is difficult, especially on south- to west-facing slopes that freeze and thaw in spring and fall. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIIe. Based on chestnut oak as the indicator species, the woodland ordination symbol is 4R in areas of the Evard soil and 3R in areas of the Cowee soil.

EvF—Evard-Cowee complex, 50 to 95 percent slopes. This very steep map unit consists mainly of a very deep, well drained Evard soil and a moderately deep, well drained Cowee soil. The unit is on side slopes in the low mountains. Individual areas range from 20 to 200 acres in size. Typically, they are 50 to 60 percent Evard soil and 20 to 30 percent Cowee soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Evard soil are as follows—

Surface layer:
0 to 5 inches, brown fine sandy loam

Subsoil:
5 to 8 inches, strong brown loam
8 to 23 inches, yellowish red sandy clay loam
23 to 35 inches, red sandy clay loam
35 to 45 inches, red fine sandy loam

Underlying material:
45 to 61 inches, multicolored sandy loam

Weathered bedrock:
61 to 66 inches, multicolored mica gneiss

The typical sequence, depth, and composition of the layers of the Cowee soil are as follows—

Surface layer:
0 to 10 inches, brown sandy loam

Subsoil:
10 to 27 inches, red clay loam

Underlying material:
27 to 38 inches, multicolored gravelly sandy loam

Weathered bedrock:
38 to 45 inches, multicolored gneiss

Permeability is moderate in the Evard and Cowee soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to weathered bedrock is more than 60 inches in the Evard soil and 20 to 40 inches in the Cowee soil. The organic matter content in the surface layer ranges from low to high.

Included in mapping are small areas of Chestnut, Edneyville, Saunook, and Trimont soils. Chestnut and Edneyville soils have less clay in the subsoil than the Evard and Cowee soils, and Saunook and Trimont soils have a darker surface layer. Chestnut, Edneyville, and Trimont soils are on north- to east-facing slopes. Saunook soils are in drainageways. Also included are small areas of rock outcrop. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Evard and Cowee soils but have a browner subsoil or more stones on the surface.

Nearly all of the acreage in this map unit is used as woodland.

This map unit is poorly suited to woodland because of the slope. The hazard of erosion and an equipment limitation are severe management concerns. These soils produce a lower volume of timber and have fewer valuable species than highly productive soils, such as Trimont soils. This unit commonly is used for timber production on National Forest lands. The most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, pitch pine, Virginia pine, and hickory. Windblown seeds from such species as black locust, red maple, pitch pine, Virginia pine, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good. Hardwood seedlings are preferred on sites where the amount of annual rainfall is more than 60 inches. Reforestation of hardwoods occurs dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. It is favored where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

The slope restricts the kinds of equipment that can be used. Operating wheeled or tracked equipment is dangerous because of the slope. Cable yarding is safer, disturbs the soils less, and maintains the productivity of the soils. When the soils are wet, unsurfaced roads are soft and slick because of the clay content.

This map unit is poorly suited to recreational uses because of the slope but in some areas is used for hiking trails. The hazard of erosion also is a management concern.

This map unit is not used for pasture, building site development, or crops. The slope is the main management concern. The hazard of erosion also is a management concern.

This map unit is poorly suited to access roads because of the slope. It commonly is used for this purpose, however, because timber production is an important use. Building and maintaining the roads are difficult and expensive. When the soils are wet, unsurfaced roads are soft and slick. Roads require surfacing for year-round use because gravel continuously sinks into the subsoil. Building the roadbed on natural soil minimizes slumping. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating large areas that have been cut and filled is difficult, especially on south- to west-facing slopes that freeze and thaw in spring and fall. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIIe. Based on chestnut oak as the indicator species, the woodland ordination symbol is 4R in areas of the Evard soil and 3R in areas of the Cowee soil.

ExC—Evard-Cowee-Urban land complex, 8 to 15 percent slopes. This strongly sloping map unit occurs mainly as areas of a very deep, well drained Evard soil; a moderately deep, well drained Cowee soil; and Urban land. The unit is on ridgetops in the low mountains. Most areas of the unit are in or near the town of Franklin. Individual areas range from 5 to 40 acres in size. Typically, they are 35 to 45 percent Evard soil, 15 to 25 percent Cowee soil, and 15 to 25 percent Urban land. The two soils and Urban land occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Evard soil are as follows—

Surface layer:
0 to 5 inches, brown fine sandy loam

Subsoil:
5 to 8 inches, strong brown loam
8 to 23 inches, yellowish red sandy clay loam
23 to 35 inches, red sandy clay loam
35 to 45 inches, red fine sandy loam

Underlying material:
45 to 61 inches, multicolored sandy loam

Weathered bedrock:
61 to 66 inches, multicolored mica gneiss

The typical sequence, depth, and composition of the layers of the Cowee soil are as follows—

Surface layer:
0 to 10 inches, brown sandy loam

Subsoil:
10 to 27 inches, red clay loam

Underlying material:
27 to 38 inches, multicolored gravelly sandy loam

Weathered bedrock:
38 to 45 inches, multicolored gneiss

Urban land consists of impervious areas that are covered with buildings, streets, sidewalks, driveways, and parking lots.

Permeability is moderate in the Evard and Cowee soils. The depth to weathered bedrock is more than 60 inches in the Evard soil and 20 to 40 inches in the Cowee soil. The organic matter content in the surface layer ranges from low to high. Surface runoff from this map unit is rapid because of the impervious cover. Runoff is particularly heavy during intense rain storms. Channel flow is common during storms.

Included in mapping are areas where some or all of the natural soil has been altered or covered as a result of grading and digging. Around many commercial buildings, grading, cutting, and filling have been extensive. Around some homes the disturbance is largely in the form of soil compaction. Also included are small areas of Braddock and Saunook soils. Braddock soils have a clayey subsoil. They are intermingled with areas of the major soils. Saunook soils have a darker surface layer than that of the Evard and Cowee soils. Saunook soils are in drainageways. Contrasting inclusions make up about 20 percent of this map unit.

Areas of this map unit near Franklin are rapidly being developed. The Evard and Cowee soils are only moderately suited to building site development and access roads because of the slope, caving of cutbanks, and the depth to bedrock. Erosion is a hazard. Runoff causes severe erosion if the soils are not protected. Erosion-control practices are needed to control pollution caused by sediments, decrease the runoff rate, and reduce the hazard of flooding in lower areas. Excavation for dwellings with basements may be hampered by the depth to bedrock in the Cowee soil and by caving of cutbanks in areas of the Evard soil. In some areas the Cowee soil is too shallow to be used as a site for septic tank absorption fields.

The capability subclass is IVe in areas of the Evard and Cowee soils and VIIIs in areas of the Urban land. This map unit has not been assigned a woodland ordination symbol.

ExD—Evard-Cowee-Urban land complex, 15 to 30 percent slopes. This moderately steep map unit occurs mainly as areas of a very deep, well drained Evard soil; a moderately deep, well drained Cowee soil; and Urban land. The unit is on ridgetops and side slopes in the low mountains. Most areas of the unit are in or near the town of Franklin. Individual areas range from 5 to 40 acres in size. Typically, they are 35 to 45 percent Evard soil, 15 to 25 percent Cowee soil, and 15 to 25 percent Urban land. The two soils and Urban land occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Evard soil are as follows—

Surface layer:
0 to 5 inches, brown fine sandy loam

Subsoil:
5 to 8 inches, strong brown loam
8 to 23 inches, yellowish red sandy clay loam
23 to 35 inches, red sandy clay loam
35 to 45 inches, red fine sandy loam

Underlying material:
45 to 61 inches, multicolored sandy loam

Weathered bedrock:
61 to 66 inches, multicolored mica gneiss

The typical sequence, depth, and composition of the layers of the Cowee soil are as follows—

Surface layer:
0 to 10 inches, brown sandy loam

Subsoil:
10 to 27 inches, red clay loam

Underlying material:
27 to 38 inches, multicolored gravelly sandy loam

Weathered bedrock:
38 to 45 inches, multicolored gneiss

Urban land consists of impervious areas that are covered with buildings, streets, sidewalks, driveways, and parking lots.

Permeability is moderate in the Evard and Cowee soils. The depth to weathered bedrock is more than 60 inches in the Evard soil and 20 to 40 inches in the Cowee soil. The organic matter content in the surface layer ranges from low to high. Surface runoff from this map unit is very rapid because of the impervious cover of buildings, streets and parking lots. Runoff is particularly heavy during intense rain storms. Channel flow is common during storms.

Included in mapping are areas where some or all of the natural soil has been altered or covered as a result of grading and digging. Around many commercial buildings, grading, cutting, and filling have been extensive. Around some homes the disturbance is largely in the form of soil compaction. Also included are small areas of Braddock and Saunook soils. Braddock soils have a clayey subsoil. They are intermingled with areas of the major soils. Saunook soils have a darker surface layer than that of the Evard and Cowee soils. They are in drainageways. Contrasting inclusions make up about 20 percent of this map unit.

The Evard and Cowee soils are poorly suited to building site development and access roads because of the slope, caving of cutbanks, and the depth to bedrock. The areas of these soils near Franklin, however, are rapidly being developed. Erosion is a hazard. Runoff causes severe erosion if the soils are not protected. Erosion-control practices are needed to control pollution caused by sediments, decrease the runoff rate, and reduce the hazard of flooding in lower areas. Excavation for dwellings with basements may be hampered by the depth to bedrock in the Cowee soil and by caving of cutbanks in areas of the Evard soil. In some areas the Cowee soil is too shallow to be used as a site for septic tank absorption fields.

The capability subclass is VIe in areas of the Evard and Cowee soils and VIIIs in areas of the Urban land. This map unit has not been assigned a woodland ordination symbol.

FaC—Fannin fine sandy loam, 8 to 15 percent slopes. This map unit consists mainly of strongly sloping, very deep, well drained Fannin and similar soils on ridgetops in the low mountains. Individual areas range from 5 to 20 acres in size.

The typical sequence, depth, and composition of the layers of the Fannin soil are as follows—

Surface layer:
0 to 4 inches, brown fine sandy loam

Subsoil:
4 to 7 inches, yellowish red fine sandy loam
7 to 21 inches, red sandy clay loam
21 to 27 inches, red fine sandy loam

Underlying material:
27 to 60 inches, multicolored sandy loam

Permeability is moderate. Surface runoff is slow in areas where undisturbed forest litter is on the surface and medium in areas without forest litter. The depth to bedrock is more than 72 inches. The organic matter content in the surface layer ranges from low to high. The underlying material has a very high content of mica, cannot be easily stabilized and compacted, and is extremely erodible.

Included in mapping are small areas of Cashiers and Chandler soils. These soils have less clay in the subsoil than the Fannin soil. Also, Cashiers soils have a darker surface layer. They are in saddles. Chandler soils are on narrow spur ridges. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Fannin soil but have a browner subsoil or more stones on the surface.

Much of the acreage in this map unit is used as woodland. Other uses include pasture, building site development, specialty crops, and recreational activities. In the southern part of the county, high summer rainfall compensates for the droughtiness of the soil and increases productivity.

This map unit is well suited to woodland. It commonly is used for timber production on National Forest lands. Privately owned areas are rarely used for timber production because of the small size of the areas and the higher profits from building site development. This soil produces a lower volume of timber and has fewer valuable species than highly productive soils, such as Cashiers soils. Because this unit commonly occurs as small areas, it is generally managed with the surrounding side slopes. The slope, the instability of the underlying material, and the hazard of erosion are management concerns. In areas of high rainfall, the most common trees are eastern white pine, yellow-poplar, white oak, and red maple. In other areas the most common trees are scarlet oak, chestnut oak, black oak, pitch pine, Virginia pine, and hickory. Windblown seeds from such species as black locust, red maple, pitch pine, Virginia pine, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good. Hardwood seedlings are preferred on sites where the amount of annual rainfall is more than 60 inches. Reforestation of hardwoods occurs dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. This map unit is droughty. White pine is generally planted where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

The use of heavy equipment should be restricted to dry periods or to periods when the ground is frozen. When the soil is wet, skid trails and unsurfaced roads are extremely erodible and very slick because of the high content of mica.

This map unit is well suited to pasture. The slope and the hazard of erosion are management concerns. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed

areas. Keeping the pasture in good condition can help to control erosion.

This map unit is only moderately suited to building site development because of the slope and the restricted permeability. It commonly is used for this purpose because it has scenic views and is crossed by many roads. The instability of the underlying material and the hazard of erosion are management concerns. Caving of cutbanks is a hazard during excavation because of the very high content of mica in the underlying material. Revegetating disturbed areas is difficult because of the slope, freezing and thawing, and the hazard of erosion. Hydroseeding is a good way to revegetate steep banks. Enlarged septic tank absorption fields are needed because of the moderate permeability. Much of this map unit is in areas where the amount of annual rainfall exceeds 70 inches. Revegetating building sites as soon as possible helps to control erosion in these areas.

This map unit is poorly suited to most specialty crops because of the hazard of erosion but is well suited to apples. The slope is a management concern. In the areas of high rainfall, this unit is commonly used for landscaping plants, such as eastern hemlock, Norway spruce, mountain laurel, and rhododendron. Fraser fir is grown in the areas of high rainfall for use as Christmas trees. Eastern white pine is grown in other areas. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff.

This map unit is well suited to recreational uses, such as hiking trails. Erosion is a hazard. The trails are very slick during rainy periods. Freezing and thawing increase the need for trail maintenance on south- and west-facing slopes.

This map unit is rarely used for row crops because of low yields. The slope and the hazard of erosion are management concerns.

This map unit is poorly suited to access roads because of low strength and frost action. It commonly is used for this purpose, however, because timber production and building site development are important uses. The slope, the hazard of erosion, the instability of the underlying material, and difficulty in compacting also are management concerns. Because unvegetated and unsurfaced roadbeds are slick and are easily eroded, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. Building the roadbed on natural soil minimizes slumping. If this soil is used as fill material for roadbeds, compacting the material is very difficult because of the high content of mica. Placing a slight tilt in the roadbed so that water flows off the downhill side is a better way to remove water than ditches, which are impractical because banks slump. This soil requires more culverts, broad-based dips, and water bars to control runoff and erosion than soils that have a lower content of mica. These measures allow water to be diverted to outlets more often and in smaller amounts. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating areas that have been cut and filled is difficult, especially on south- and west-facing slopes that freeze and thaw in spring and fall.

The capability subclass is VIe. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 7A.

FaD—Fannin fine sandy loam, 15 to 30 percent slopes. This map unit consists mainly of moderately steep, very deep, well drained Fannin and similar soils on side slopes and ridgetops in the low mountains. Individual areas range from 5 to 40 acres in size.

The typical sequence, depth, and composition of the layers of the Fannin soil are as follows—

Surface layer:

0 to 4 inches, brown fine sandy loam

Subsoil:

4 to 7 inches, yellowish red fine sandy loam
7 to 21 inches, red sandy clay loam
21 to 27 inches, red fine sandy loam

Underlying material:

27 to 60 inches, multicolored sandy loam

Permeability is moderate. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to bedrock is more than 72 inches. The organic matter content in the surface layer ranges from low to high. The underlying material has a very high content of mica, cannot be easily stabilized and compacted, and is extremely erodible.

Included in mapping are small areas of Cashiers, Chandler, and Saunook soils. Cashiers and Chandler soils have less clay in the subsoil than the Fannin soil, Cashiers and Saunook soils have a darker surface layer, and Saunook soils have less mica. Cashiers soils are on north- to east-facing head slopes. Chandler soils are on narrow spur ridges. Saunook soils are in drainageways. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Fannin soil but have a browner subsoil or more stones on the surface.

Much of the acreage in this map unit is used as woodland. Other uses include pasture, building site

development, specialty crops, and recreational activities. In the southern part of the county, high summer rainfall compensates for the droughtiness of the soil and increases productivity.

This map unit is only moderately suited to woodland because of the slope. The hazard of erosion and an equipment limitation are moderate management concerns. The instability of the underlying material also is a management concern. This unit commonly is used for timber production on National Forest lands. Privately owned areas are rarely used for timber production because of the small size of the areas and the higher profits from building site development. This soil produces a lower volume of timber and has fewer valuable species than highly productive soils, such as Cashiers soils. In areas of high rainfall, the most common trees are eastern white pine, yellow-poplar, white oak, and red maple. In other areas the most common trees are scarlet oak, chestnut oak, black oak, pitch pine, Virginia pine, and hickory. Windblown seeds from such species as black locust, red maple, pitch pine, Virginia pine, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good. Hardwood seedlings are preferred on sites where the amount of annual rainfall is more than 60 inches. Reforestation of hardwoods occurs dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. This map unit is droughty. White pine is generally planted where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

The use of heavy equipment should be restricted to dry periods or to periods when the ground is frozen. When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick because of the high content of mica.

This map unit is only moderately suited to pasture because of the slope. Erosion is a hazard. Operating farm equipment is difficult because of the slope. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Keeping the pasture in good condition can help to control erosion.

This map unit is poorly suited to building site development because of the slope. It commonly is used for this purpose, however, because it has scenic views and is crossed by many roads. The instability of the underlying material and the hazard of erosion are management concerns. Caving of cutbanks is a hazard during excavation because of the very high content of mica in the underlying material. Revegetating disturbed areas is difficult because of the slope, freezing and thawing, and the hazard of erosion. Hydroseeding is a good way to revegetate steep banks. Enlarged septic tank absorption fields are needed because of the restricted permeability. Much of this map unit is in areas where the amount of annual rainfall exceeds 70 inches. Revegetating building sites as soon as possible helps to control erosion in these areas.

This map unit is poorly suited to specialty crops, such as apples, landscaping plants, and Christmas trees, because of the slope. The hazard of erosion also is a management concern. In the areas of high rainfall, the most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, and rhododendron. Fraser fir is grown in these areas for use as Christmas trees. Eastern white pine is grown in other areas. Operating farm equipment is difficult because of the slope. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff.

This map unit is only moderately suited to recreational uses, such as hiking trails, because of the slope. Erosion is a hazard. The trails are very slick during rainy periods. Freezing and thawing increase the need for trail maintenance on south- and west-facing slopes.

This map unit is not used for row crops. The slope and the hazard of erosion are management concerns.

This map unit is poorly suited to access roads because of the slope, low strength, and frost action. It commonly is used for this purpose, however, because timber production and building site development are important uses. The hazard of erosion, the instability of the underlying material, and difficulty in compacting also are management concerns. Because unvegetated and unsurfaced roadbeds are slick and are easily eroded, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. Building the roadbed on natural soil minimizes slumping. If this soil is used as fill material for roadbeds, compacting the material is very difficult because of the high content of mica. Placing a slight tilt in the roadbed so that water flows off the downhill side

is a better way to remove water than ditches, which are impractical because banks slump. This soil requires more culverts, broad-based dips, and water bars to control runoff and erosion than soils that have a lower content of mica. These measures allow water to be diverted to outlets more often and in smaller amounts. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating areas that have been cut and filled is difficult, especially on south- and west-facing slopes that freeze and thaw in spring and fall. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIIe. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 7R.

FaE—Fannin fine sandy loam, 30 to 50 percent slopes. This map unit consists mainly of steep, very deep, well drained Fannin and similar soils on side slopes and narrow ridgetops in the low mountains. Individual areas range from 5 to 50 acres in size.

The typical sequence, depth, and composition of the layers of the Fannin soil are as follows—

Surface layer:
0 to 4 inches, brown fine sandy loam

Subsoil:
4 to 7 inches, yellowish red fine sandy loam
7 to 21 inches, red sandy clay loam
21 to 27 inches, red fine sandy loam

Underlying material:
27 to 60 inches, multicolored sandy loam

Permeability is moderate. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to bedrock is more than 72 inches. The organic matter content in the surface layer ranges from low to high. The underlying material has a very high content of mica, cannot be easily stabilized and compacted, and is extremely erodible.

Included in mapping are small areas of Cashiers, Chandler, and Saunook soils. Cashiers and Chandler soils have less clay in the subsoil than the Fannin soil, Cashiers and Saunook soils have a darker surface layer, and Saunook soils have less mica. Cashiers and Chandler soils are on north- to east-facing slopes. Saunook soils are in drainageways. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Fannin soil but have a browner subsoil or more stones on the surface.

Much of the acreage in this map unit is used as woodland. Other uses include pasture, building site development, specialty crops, and recreational activities. In the southern part of the county, high summer rainfall compensates for the droughtiness of the soil and increases productivity.

This map unit is poorly suited to woodland because of the slope. The hazard of erosion and an equipment limitation are severe management concerns. The instability of the underlying material also is a management concern. This unit commonly is used for timber production on National Forest lands. Privately owned areas are rarely used for timber production because of the higher profits from building site development. This soil produces a lower volume of timber and has fewer valuable species than highly productive soils, such as Cashiers soils. In areas of high rainfall, the most common trees are eastern white pine, yellow-poplar, white oak, and red maple. In other areas the most common trees are scarlet oak, chestnut oak, black oak, pitch pine, Virginia pine, and hickory. Windblown seeds from such species as black locust, red maple, pitch pine, Virginia pine, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good. Hardwood seedlings are preferred on sites where the amount of annual rainfall is more than 60 inches. Reforestation of hardwoods occurs dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. This map unit is droughty. White pine is generally planted where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

The use of heavy equipment should be restricted to dry periods or to periods when the ground is frozen. When the soil is wet, skid trails and unsurfaced roads are extremely erodible and very slick because of the high content of mica.

This map unit is poorly suited to pasture because of the slope. The hazard of erosion also is a management concern. Operating farm equipment is dangerous because of the slope. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Generally, weeds are controlled and fertilizer and lime are applied by hand.

Keeping the pasture in good condition can help to control erosion.

This map unit is poorly suited to building site development because of the slope. The instability of the underlying material and the hazard of erosion also are management concerns. Septic tank absorption fields should be dug by hand because of the slope. Caving of cutbanks is a hazard during excavation because of the very high content of mica in the underlying material. Revegetating disturbed areas is difficult because of the slope, freezing and thawing, and the hazard of erosion. Hydroseeding is a good way to revegetate steep cutbanks.

This map unit is poorly suited to specialty crops, such as apples, landscaping plants, and Christmas trees, because of the slope. The hazard of erosion also is a management concern. In the areas of high rainfall, the most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, and rhododendron. Fraser fir is grown for use as Christmas trees. Operating farm equipment is difficult because of the slope. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff.

This map unit is poorly suited to recreational uses, such as hiking trails, because of the slope. The hazard of erosion also is a management concern. The trails are very slick during rainy periods. Freezing and thawing increase the need for trail maintenance on south- and west-facing slopes.

This map unit is not used for row crops. The slope and the hazard of erosion are management concerns.

This map unit is poorly suited to access roads because of the slope, low strength, and frost action. It commonly is used for this purpose, however, because timber production and building site development are important uses. The hazard of erosion, the instability of the underlying material, and difficulty in compacting also are management concerns. Because unvegetated and unsurfaced roadbeds are slick and are easily eroded, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. Building the roadbed on natural soil minimizes slumping. If this soil is used as fill material for roadbeds, compacting the material is very difficult because of the high content of mica. Placing a slight tilt in the roadbed so that water flows off the downhill side is a better way to remove water than ditches, which are impractical because banks slump. This soil requires more culverts, broad-based dips, and water bars to control runoff and erosion than soils that have a lower content of mica. These measures allow water to be diverted to outlets more often and in smaller amounts. Seeding cutbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating large areas that have been cut and filled is difficult, especially on south- and west-facing slopes that freeze and thaw in spring and fall. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIIe. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 7R.

FaF—Fannin fine sandy loam, 50 to 95 percent slopes. This map unit consists mainly of very steep, very deep, well drained Fannin and similar soils on side slopes in the low mountains. Individual areas range from 10 to 80 acres in size.

The typical sequence, depth, and composition of the layers of the Fannin soil are as follows—

Surface layer:
0 to 4 inches, brown fine sandy loam

Subsoil:
4 to 7 inches, yellowish red fine sandy loam
7 to 21 inches, red sandy clay loam
21 to 27 inches, red fine sandy loam

Underlying material:
27 to 60 inches, multicolored sandy loam

Permeability is moderate. Surface runoff is slow in areas where undisturbed forest litter is on the surface and medium in areas without forest litter. The depth to bedrock is more than 72 inches. The organic matter content in the surface layer ranges from low to high. The underlying material has a very high content of mica, cannot be easily stabilized and compacted, and is extremely erodible.

Included in mapping are small areas of Cashiers, Chandler, and Saunook soils. Cashiers and Chandler soils have less clay in the subsoil than the Fannin soil, Cashiers and Saunook soils have a darker surface layer, and Saunook soils have less mica. Cashiers and Chandler soils are on north- to east-facing slopes. Saunook soils are in drainageways. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Fannin soil but have a browner subsoil or more stones on the surface.

Nearly all of the acreage in this map unit is used for woodland. In the southern part of the county, high summer rainfall compensates for the droughtiness of the soil and increases productivity.

This map unit is poorly suited to woodland because of the slope. The hazard of erosion and an equipment limitation are severe management concerns. The instability of the underlying material also is a

management concern. This unit commonly is used for timber production on National Forest lands. It produces a lower volume of timber and has fewer valuable species than highly productive soils, such as Cashiers soils. In the areas of high rainfall, the most common trees are eastern white pine, yellow-poplar, white oak, and red maple. In other areas the most common trees are scarlet oak, chestnut oak, black oak, pitch pine, Virginia pine, and hickory.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good. Hardwood seedlings are preferred on sites where the amount of annual rainfall is more than 60 inches. Reforestation of hardwoods occurs dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. This map unit is droughty. White pine is generally planted where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

When the soil is wet, unsurfaced roads are extremely erodible and very slick because of the high content of mica. The slope restricts the kinds of equipment that can be used. Generally, operating wheeled or tracked equipment is dangerous because of the slope. Cable yarding is safer, disturbs the soil less, and helps to maintain productivity.

This map unit is poorly suited to recreational uses, such as hiking trails, because of the slope. The hazard of erosion also is a management concern. The trails are very slick during rainy periods. Freezing and thawing increase the need for trail maintenance on south- and west-facing slopes.

This map unit is not used for pasture, building site development, or crops. The slope is the main management concern. The hazard of erosion also is a management concern.

This map unit is poorly suited to access roads because of the slope. It is used for this purpose, however, because timber production is a use. The hazard of erosion, the instability of the underlying material, and difficulty in compacting also are management concerns. Building and maintaining roads are difficult and expensive. Because unvegetated and unsurfaced roadbeds are slick and are easily eroded, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. Building the roadbed on natural soil minimizes slumping. If this soil is used as fill material for roadbeds, compacting the material is very difficult because of the high content of mica. Placing a slight tilt in the roadbed so that water flows off the downhill side is a better way to remove water than ditches, which are impractical because banks slump. This soil requires more culverts, broad-based dips, and water bars to control runoff and erosion than soils that have a lower content of mica. These measures allow water to be diverted to outlets more often and in smaller amounts. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating large areas that have been cut and filled is difficult, especially on south- and west-facing slopes that freeze and thaw in spring and fall. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIIe. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 7R.

HaB2—Hayesville clay loam, 2 to 8 percent slopes, eroded. This map unit consists mainly of gently sloping, very deep, well drained Hayesville and similar soils on moderately broad ridges in the uplands of low rolling hills. Individual areas are irregular in shape and range from 2 to 40 acres in size.

The typical sequence, depth, and composition of the layers of the Hayesville soil are as follows—

Surface layer:
0 to 6 inches, reddish brown clay loam

Subsoil:
6 to 18 inches, red clay
18 to 33 inches, red clay loam
33 to 45 inches, red loam

Underlying material:
45 to 60 inches, multicolored loam

Permeability is moderate. Surface runoff is slow in areas where undisturbed forest litter is on the surface and medium in areas without forest litter. Maintaining good tilth is difficult because of a high content of clay and crusting after rains. Clods form if the soil is worked during wet periods. Crushing the clods is difficult. The crust and the clods interfere with seed germination. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is low.

Included in mapping are small areas of Evard and Fannin soils. These soils have a loamy subsoil. Also,

the subsoil of the Fannin soil has more mica than that of the Hayesville soil. Also included are a few areas that have a cobbly surface layer. Contrasting inclusions are in the same landscape position as the Hayesville soil and make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Hayesville soil but have a surface layer that is gravelly or loam.

Much of the acreage in this map unit is used as pasture or hayland. Other uses include specialty crops, building site development, and woodland.

This map unit is well suited to pasture and hay. Alfalfa grows particularly well on this soil. Erosion is a hazard, especially in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Grazing during wet periods causes severe compaction, increases the runoff rate, and reduces the rate of water infiltration. Keeping the pasture and hayland in good condition can help to control erosion.

This map unit is only moderately suited to specialty crops, such as apples, because of the hazard of erosion. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff.

This map unit is only moderately suited to building site development because of the restricted permeability and a high content of clay in the subsoil. It commonly is used for building site development because it is gently sloping, has scenic views, and is crossed by many roads in the county. Erosion is a hazard.

This map unit is only moderately suited to woodland because of a high content of clay in the surface layer. An equipment limitation and plant competition are moderate management concerns. This map unit generally is not used for timber production because of the small size of the areas and the higher profits from crops, building site development, pasture, and hayland. The most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, pitch pine, Virginia pine, and hickory.

This map unit is well suited to recreational uses, such as camp sites and picnic areas. It is rarely used for these purposes, however, because it is not near streams and generally has few trees and little shade.

This map unit is rarely used for row crops because of low yields. The slope and the hazard of erosion are management concerns.

This map unit is only moderately suited to access roads because of low strength and frost action. It commonly is used for this purpose because building site development is an important use. The slope and the hazard of erosion are management concerns. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality.

The capability subclass is IIIe. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 6C.

HaC2—Hayesville clay loam, 8 to 15 percent slopes, eroded. This map unit consists mainly of strongly sloping, very deep, well drained Hayesville and similar soils on moderately broad ridges in the uplands of low rolling hills. Individual areas are irregular in shape and range from 3 to 30 acres in size.

The typical sequence, depth, and composition of the layers of the Hayesville soil are as follows—

Surface layer:
0 to 6 inches, reddish brown clay loam

Subsoil:
6 to 18 inches, red clay
18 to 33 inches, red clay loam
33 to 45 inches, red loam

Underlying material:
45 to 60 inches, multicolored loam

Permeability is moderate. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. A crust may form on the surface after rainfall. It can cause ponding in concave areas or where outlets have been blocked. Maintaining good tilth is difficult because of a high content of clay and the crusting. Clods form if the soil is worked during wet periods. Crushing the clods is difficult. The crust and the clods interfere with seed germination. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is low.

Included in mapping are small areas of Evard and Fannin soils. These soils have less clay in the subsoil than the Hayesville soil. Also, Fannin soils have more mica in the subsoil. Also included are a few areas of soils that have a cobbly surface layer. Contrasting inclusions are in the same landscape position as the Hayesville soil and make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Hayesville soil but have a surface layer that is gravelly or loam.

Much of the acreage in this map unit is used as pasture or hayland. Other uses include specialty crops, building site development, and woodland.

This map unit is well suited to pasture and hay. Alfalfa grows particularly well on this soil. The slope and the hazard of erosion are management concerns. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Grazing during wet periods causes severe compaction, increases the runoff rate, and reduces the rate of water infiltration. Keeping the pasture and hayland in good condition can help to control erosion.

This map unit is poorly suited to specialty crops because of the hazard of erosion but is used for apples. The slope also is a management concern. Establishing and maintaining sod minimize erosion and help to control runoff.

This map unit is only moderately suited to building site development because of the slope, the restricted permeability, and a high content of clay in the subsoil. It commonly is used for building site development because it is strongly sloping, has scenic views, and is crossed by many roads in the county. Erosion is a hazard.

This map unit is only moderately suited to woodland because of a high content of clay in the surface layer. An equipment limitation and plant competition are moderate management concerns. This map unit generally is not used for timber production because of the small size of the areas and the higher profits from crops, building site development, pasture, and hayland. The most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, pitch pine, Virginia pine, and hickory.

This map unit is only moderately suited to recreational uses, such as camp sites and picnic areas, because of the slope. It is rarely used for these purposes because it is not near streams and generally has few trees and little shade. Erosion is a hazard.

This map unit is rarely used for row crops because of low yields. The slope and the hazard of erosion are management concerns.

This map unit is only moderately suited to access roads because of the slope, low strength, and frost action. It commonly is used for this purpose because building site development is an important use. The hazard of erosion is a management concern. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality.

The capability subclass is IVe. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 6C.

HaD2—Hayesville clay loam, 15 to 30 percent slopes, eroded. This map unit consists mainly of moderately steep, very deep, well drained Hayesville and similar soils on side slopes and ridgetops in the uplands of low rolling hills. Individual areas are irregular in shape and range from 4 to 30 acres in size.

The typical sequence, depth, and composition of the layers of the Hayesville soil are as follows—

Surface layer:
0 to 6 inches, reddish brown clay loam

Subsoil:
6 to 18 inches, red clay
18 to 33 inches, red clay loam
33 to 45 inches, red loam

Underlying material:
45 to 60 inches, multicolored loam

Permeability is moderate. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. A crust may form on the surface after rainfall. It can cause ponding in concave areas or where outlets have been blocked. Maintaining good tilth is difficult because of a high content of clay and the crusting. Clods form if the soil is worked during wet periods. Crushing the clods is difficult. The crust and the clods interfere with seed germination. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is low.

Included in mapping are small areas of Evard, Fannin, and Saunook soils. These soils have less clay in the subsoil than the Hayesville soil. Also, Fannin soils have more mica in the subsoil and Saunook soils have a darker surface layer. Evard and Fannin soils are in the same landscape position as the Hayesville soil. Saunook soils are in drainageways. Also included are a few areas of soils that have a cobbly surface layer. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Hayesville soil but have a surface layer that is gravelly or loam.

Much of the acreage in this map unit is used as pasture. Other uses include building site development, woodland, and specialty crops.

This map unit is only moderately suited to pasture because of the slope. The hazard of erosion also is a management concern. Operating farm equipment is difficult because of the slope. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Grazing during wet periods causes severe compaction, increases the runoff rate, and reduces the rate of water infiltration.

Keeping the pasture in good condition can help to control erosion.

This map unit is only moderately suited to building site development because of the slope. A high content of clay, the restricted permeability, and the hazard of erosion also are management concerns. This unit commonly is used for building site development because it is strongly sloping, has scenic views, and is crossed by many roads. Revegetating disturbed areas is difficult because of the slope and freezing and thawing. Hydroseeding is a good way to revegetate steep banks.

This map unit is only moderately suited to woodland because of the slope. The hazard of erosion and an equipment limitation are moderate management concerns. This unit commonly is wooded. It is rarely used for timber production, however, because of the higher profits from building site development. The most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, pitch pine, Virginia pine, and hickory.

This map unit is poorly suited to specialty crops because of the hazard of erosion but is used for apples. The slope also is a management concern. Operating farm equipment is difficult because of the slope. Establishing and maintaining sod minimize erosion and help to control runoff.

This map unit is poorly suited to recreational uses, such as camp sites and picnic areas, because of the slope. The hazard of erosion also is a management concern.

This map unit is not used for crops. The slope and the hazard of erosion are management concerns.

This map unit is poorly suited to access roads because of the slope. It commonly is used for this purpose, however, because building site development is an important use. The content of clay, low strength, and frost action are management concerns. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. Building the roadbed on natural soil minimizes slumping. Road construction results in areas that have been cut and filled. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating disturbed areas is difficult, especially on south- to west-facing slopes that freeze and thaw in spring and fall. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIe. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 6R.

HmA—Hemphill loam, 0 to 3 percent slopes, rarely flooded. This map unit consists mainly of nearly level, very deep, very poorly drained Hemphill and similar soils in depressions on low stream terraces. Individual areas are long bands and range from 2 to 25 acres in size.

The typical sequence, depth, and composition of the layers of the Hemphill soil are as follows—

Surface layer:

0 to 8 inches, very dark grayish brown loam

Subsoil:

8 to 13 inches, dark gray clay loam

13 to 32 inches, gray clay loam that has strong brown mottles

32 to 60 inches, gray sandy clay loam that has strong brown mottles

Permeability is slow. Surface runoff is slow. Crusting increases the hazard of ponding where outlets have been blocked. The soil is subject to rare flooding. The seasonal high water table is at the surface to 1 foot below the surface. The depth to bedrock is more than 60 inches. The surface layer is friable. Operating equipment is extremely difficult when the soil is wet.

Included in mapping are small areas of Dillard and Nikwasi soils. Dillard soils are moderately well drained. They have less clay in the subsoil than the Hemphill soil. Nikwasi soils are moderately deep to strata of cobbles, gravel, and sand. They are frequently flooded. Dillard soils are on small knolls. Nikwasi soils are in areas where small streams cross the unit. Also included are areas of somewhat poorly drained soils. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Hemphill soil but have a thicker surface layer.

Much of the acreage in this map unit is used as pasture or hayland. Other uses include row crops and woodland.

This map unit is only moderately suited to pasture and hay because of the wetness. Where drained, it commonly is used as pasture or hayland because it is nearly level and has high yields during dry seasons. Drainage, ponding, compaction, runoff from the adjacent higher areas, the flooding, and damage to streambanks are management concerns. The effectiveness of tile drainage is reduced by the slow permeability in the subsoil, the nearly level slope, and poor outlets. Land shaping helps to open outlets and drain surface water from depressions. Grazing during wet periods causes compaction, increases the hazard of ponding, and reduces the rate of water infiltration. Properly locating watering facilities, stream crossings,

and fences can help to prevent damage to streambanks and improve water quality.

This map unit is only moderately suited to row crops because of the wetness. Where drained, it is used for crops because it has high yields. The most common crops are corn for silage, sweet corn, and strawberries. Ponding, drainage, crusting, runoff from the adjacent higher areas, and the flooding are management concerns. The effectiveness of tile drainage is reduced by the slow permeability in the subsoil, the nearly level slope, and poor outlets. Irrigation is used to protect some crops from frost and to supply supplemental water. Frost commonly occurs on this soil when the higher adjacent areas are frost free. Mulch is used in areas where strawberries are grown. It holds moisture, controls weeds, and keeps the berries clean. Properly designed plowing patterns are needed to keep drainage outlets open and to prevent the formation of depressions. Diversions, grassed field borders, and grassed waterways can divert water from the higher areas around row crops. Herbicides may be ineffective because of the organic matter content. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat.

This map unit is poorly suited to woodland because of the wetness. An equipment limitation is a severe management concern. This unit generally is not used for timber production because of the small size of the areas and the higher profits from crops, pasture, and hayland. Yellow-poplar is the most common tree. Alder and red maple dominate sites that have been cleared and are reverting to woodland.

This map unit is poorly suited to building site development because of the wetness, the shrink-swell potential, and the slow permeability. The flooding, drainage, runoff from adjacent areas, and ponding also are management concerns.

This map unit is poorly suited to recreational uses because of the wetness and the flooding but in some areas is used for parks, picnic areas, ball fields, or tennis courts. Drainage is needed. Ponding is a management concern. Water management practices similar to those used in pasture are appropriate.

This map unit is poorly suited to access roads because of shrinking and swelling, the wetness, and the flooding. Runoff and ponding also are management concerns. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. The roads should be designed so that runoff from the adjacent higher areas is diverted. Roadbeds should be elevated. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality.

The capability subclass is IVw in drained areas and VIw in undrained areas. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 6W.

NkA—Nikwasi fine sandy loam, 0 to 2 percent slopes, frequently flooded. This map unit consists mainly of nearly level, very deep, poorly drained and very poorly drained Nikwasi and similar soils in depressions on flood plains along small streams. Individual areas are long bands and range from 2 to 20 acres in size.

The typical sequence, depth, and composition of the layers of the Nikwasi soil are as follows—

Surface layer:

0 to 9 inches, very dark grayish brown fine sandy loam

9 to 17 inches, very dark grayish brown loamy sand

17 to 25 inches, very dark gray sand

Underlying material:

25 to 60 inches, dark gray extremely gravelly sand

Permeability is moderately rapid in the upper layers and rapid in the underlying material. Surface runoff is very slow or ponded. The soil is frequently flooded for very brief periods. The seasonal high water table is at the surface to 1 foot below the surface. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is high or very high. The surface layer is friable.

Included in mapping are small areas of Dellwood and Reddies soils. These soils are moderately well drained. Also, Dellwood soils are shallow to strata of cobbles, pebbles, and sand. They are in areas scoured by floodwater or in areas where smaller streams cross the unit. Reddies soils are on small knolls. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Nikwasi soil but have 4 to 10 inches of light colored, recent overwash or have a surface layer that is less than 24 inches thick.

Much of the acreage in this map unit is used as pasture. Other uses include woodland and recreational activities.

This map unit is only moderately suited to pasture and hay because of the wetness and the flooding. Where drained, it commonly is used for pasture because it is nearly level. Ponding, compaction, runoff from the adjacent higher areas, and damage to streambanks are management concerns. A tile drainage system is difficult and expensive to install because of shallowness to contrasting layers, the nearly level

slope, and poor outlets. Land shaping helps to open outlets and drain surface water from depressions. Grazing during wet periods causes compaction, increases the hazard of ponding, and reduces the rate of water infiltration. Properly locating watering facilities, stream crossings, and fences can help to prevent damage to streambanks and improve water quality.

This map unit is poorly suited to woodland because of the wetness and the flooding. An equipment limitation is a severe management concern. This map unit generally is not used for timber production because of the small size of the areas. The few areas that are used for timber production are on National Forest lands. Management in these areas is determined by the impact of the management on local streams. Most areas of this unit have been cleared of trees at some time. Alder and red maple dominate privately owned sites that are reverting to woodland. The most common trees in wooded areas are yellow-poplar, eastern white pine, sweet birch, and eastern hemlock. In cutover stands rhododendron commonly forms a canopy.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good and hardwood seedlings are available. Reforestation of hardwoods occurs dominantly through sprouting. Cutting all trees and large shrubs increases the number and quality of the sprouts.

In cleared areas eastern white pine can be successfully established. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs.

Care is needed to prevent soil compaction. The use of heavy equipment should restricted to dry periods or to periods when the ground is frozen. When the soil is wet, skid trails and unsurfaced roads are very slick because of the organic matter content.

This map unit is poorly suited to recreational uses because of the wetness and the flooding, but some areas are drained, filled, and used as camp sites. This unit is desirable for this purpose because of the nearly level terrain and the proximity to streams. A drainage system is difficult and expensive to install because of the shallowness to water, the nearly level slope, and poor outlets. Water management practices similar to those used in pasture management are appropriate.

This map unit is not used for row crops or building site development. The flooding, the wetness, and ponding are the main management concerns.

This map unit is poorly suited to access roads because of the wetness and the flooding. The U.S. Forest Service generally does not use areas of this map unit for access roads, but some areas are crossed by short sections of roads perpendicular to streams. Runoff from the adjacent higher areas and ponding are management concerns. Elevating roads during construction minimizes the damage caused by flooding and provides a suitable roadbed. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. The roads should be designed so that runoff is diverted. The number of culverts needed per mile of road is very high compared to the number needed on soils in the uplands.

The capability subclass is VIw. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 6W.

OwE—Oconaluftee channery loam, windswept, 30 to 50 percent slopes. This map unit consists mainly of steep, very deep, well drained Oconaluftee and similar soils on ridgetops and side slopes in the high mountains. The unit is only on a few high peaks in the northwestern part of the county. Individual areas are irregular in shape and range from 5 to 25 acres in size.

The typical sequence, depth, and composition of the layers of the Oconaluftee soil are as follows—

Surface layer:

0 to 8 inches, black channery loam

8 to 12 inches, very dark brown channery loam

Subsoil:

12 to 44 inches, dark grayish brown channery loam

Underlying material:

44 to 60 inches, multicolored flaggy fine sandy loam

Permeability is moderately rapid. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is very high. The climate is severe. Winter is cold, icy, and windy. The rest of the year is rainy, foggy, and cool. The soil is frozen for long periods in the winter. Landslides occur on this soil.

Included in mapping are small areas of Spivey soils. These soils have more than 35 percent rock fragments in the subsoil. They are in drainageways. Also included are small areas of soils that have bedrock within a depth of 60 inches. These soils are around small areas of rock outcrop or seeps. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Oconaluftee soil but have a dark surface layer that is less than 10 or more than 20 inches thick

or have more stones on the surface. Where the surface layer is less than 10 inches thick, the soils are on nose slopes or shoulder slopes. Where the surface layer is more than 20 inches thick, the soils are in saddles.

All of the acreage in this map unit is wooded and is in the Nantahala National Forest. It is used for recreational activities.

This map unit is poorly suited to woodland because of the slope and severe climatic conditions, which cause low productivity. The hazard of erosion and an equipment limitation are severe management concerns. This unit is not used for commercial timber production because the trees are stunted, twisted, or otherwise damaged by wind and ice. Northern red oak is the most common tree. Other trees include a few sweet birch and yellow birch.

This map unit is poorly suited to recreational uses because of the slope, but some areas are used for overlooks and hiking trails. The hazard of erosion also is a management concern. Freezing and thawing increase the need for trail maintenance.

This map unit is not used for crops, pasture, hayland, or building site development. The slope, difficult access across steep terrain, the cold climate, stones, and the hazard of erosion are management concerns.

This map unit is poorly suited to access roads because of the slope. Some areas are used for roads that access fire towers and wildlife fields. Damage to road surfaces is severe because of the climate. The instability of the underlying bedrock, freezing and thawing of the surface layer, and the hazard of erosion are management concerns. Because unsurfaced roads are slick when wet, surfacing is required for year-round use. Building the roadbed on natural soil minimizes slumping. The underlying bedrock is very susceptible to mass movement, especially during periods of heavy rainfall and high traffic. The orientation of the dip in the rock as it relates to the roadbed greatly affects the likelihood of mass movement occurring. Placing a slight tilt in the roadbed so that water flows off the downhill side is a better way to remove water than ditches, which are impractical because banks slump. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating large areas that have been cut and filled is difficult because of the slope, slumping, and freezing and thawing in spring and fall. Hydroseeding is a good way to revegetate steep roadbanks. Large amounts of ultra acid, sulfur-bearing rock may be exposed by road building. Water seeping through or flowing over this rock may enter nearby streams and kill aquatic life. A plant cover is required to control freezing and thawing of fill material. Lime and fertilizer are required to establish and maintain vegetation.

The capability subclass is VIIe. Based on northern red oak as the indicator species, the woodland ordination symbol is 2R.

PwC—Plott fine sandy loam, 8 to 15 percent slopes, stony. This map unit consists mainly of strongly sloping, very deep, well drained Plott and similar soils on moderately broad ridgetops in the intermediate mountains. The unit is on north- to northeast-facing slopes and on south- to west-facing slopes shaded by higher mountains. Scattered stones and boulders are on the surface. Individual areas are irregular in shape and range from 4 to 30 acres in size.

The typical sequence, depth, and composition of the layers of the Plott soil are as follows—

Surface layer:

0 to 6 inches, very dark brown fine sandy loam

6 to 14 inches, very dark grayish brown fine sandy loam

Subsoil:

14 to 46 inches, dark yellowish brown fine sandy loam

46 to 62 inches, dark yellowish brown gravelly fine sandy loam

Permeability is moderately rapid. Surface runoff is slow in areas where undisturbed forest litter is on the surface and medium in areas without forest litter. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is high or very high. Stones on the surface interfere with tillage. If the larger stones are removed, the surface layer is friable and easily tilled throughout a fairly wide range in moisture content. The soil is frozen for long periods in the winter and warms up later in the spring than other soils on south- to west-facing slopes that are at the same elevation.

Included in mapping are small areas of Chestnut and Edneyville soils. These soils have a surface layer that is thinner or lighter in color than that of the Plott soil. Also, Chestnut soils are moderately deep over weathered bedrock. Chestnut and Edneyville soils are on south- to west-facing spur ridges. Also included are small areas of rock outcrop. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Plott soil but have a dark surface layer that is less than 10 or more than 20 inches thick or have fewer stones on the surface. Where the surface layer is less than 10 inches thick, the soils are on nose slopes or shoulder slopes of the ridges. Where the surface layer is more than 20 inches thick, the soils are in saddles.

Much of the acreage in this map unit is used as woodland. Other uses include pasture, specialty crops, recreational activities, and building site development.

This map unit is well suited to woodland. It is desirable for timber production because of high productivity and valuable species. It is commonly used for this purpose on National Forest lands. Privately owned areas are rarely used for timber production because of a high potential value for building site development, small size of the areas, and difficult access in some areas. The most common trees are northern red oak, black cherry, sweet birch, and sugar maple. Yellow-poplar is common at the lower elevations. Yellow birch, American beech, and eastern hemlock are common at the upper elevations. Scarlet oak, white oak, black oak, and hickory are common on severely high-graded sites. Windblown seeds from such species as yellow-poplar, black locust, sugar maple, eastern hemlock, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good and hardwood seedlings are available. Reforestation of hardwoods occurs dominantly through sprouting. In cutover stands cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

White pine can be successfully established in cleared areas. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

Using heavy equipment only during dry periods or periods when the ground is frozen helps to prevent soil compaction. When the soil is wet, skid trails and unsurfaced roads are slick because of the organic matter content.

This map unit is well suited to summer pasture. The slope, stones, and the hazard of erosion are management concerns. Most of the large stones are removed when sod is established. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. The soil warms up late in the spring. Cool season grasses, such as tall fescue and orchardgrass, can provide late season pasture. Keeping the pasture in good condition helps to control erosion.

This map unit is only moderately suited to specialty crops because of the slope but commonly is used for landscaping plants and Christmas trees. Limited access across steep terrain, the hazard of erosion, and stones also are management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, and rhododendron. Fraser fir is grown for use as Christmas trees. Most of the large stones are removed when areas of this unit are converted to production of specialty crops. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff. Mulch can be used to help control erosion in cultivated areas where sod cannot be used. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat.

This map unit is only moderately suited to building site development because of the slope. Caving of cutbanks is a severe management concern affecting shallow excavations. Stones, the hazard of erosion, and limited access across steep terrain also are management concerns. Because of cold winter temperatures, building sites are used mainly for summer homes. Revegetating disturbed areas is difficult because of the slope and erosion. Hydroseeding is a good way to revegetate steep banks. This map unit is in areas where the amount of annual rainfall exceeds 70 inches. Revegetating building sites as soon as possible helps to control erosion in these areas.

This map unit is well suited to overlooks and hiking trails. It is only moderately suited to most other recreational uses because of the slope. Erosion is a hazard.

This map unit is not used for row crops. The slope, stones, a short growing season, and the hazard of erosion are management concerns.

This map unit is only moderately suited to access roads because of the slope and frost action. It commonly is used for this purpose because timber production and building site development are important uses. The hazard of erosion is a management concern. Because unsurfaced roads are slick when wet, surfacing is required for year-round use. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating areas that have been cut and filled is difficult because of the slope.

The capability subclass is IVe. Based on northern red oak as the indicator species, the woodland ordination symbol is 5A.

PwD—Plott fine sandy loam, 15 to 30 percent slopes, stony. This map unit consists mainly of moderately steep, very deep, well drained Plott and similar soils on moderately broad ridgetops in the intermediate mountains. The unit is on north- to east-

facing slopes and on south- to west-facing slopes shaded by higher mountains. Scattered stones and boulders are on the surface. Individual areas are irregular in shape and range from 5 to 40 acres in size.

The typical sequence, depth, and composition of the layers of the Plott soil are as follows—

Surface layer:

0 to 6 inches, very dark brown fine sandy loam

6 to 14 inches, very dark grayish brown fine sandy loam

Subsoil:

14 to 46 inches, dark yellowish brown fine sandy loam

46 to 62 inches, dark yellowish brown gravelly fine sandy loam

Permeability is moderately rapid. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is high or very high. Stones on the surface interfere with tillage unless the larger stones are removed. The soil is frozen for long periods in the winter and warms up later in the spring than other soils on south- to west-facing slopes that are at the same elevation.

Included in mapping are small areas of Chestnut and Edneyville soils. These soils have a surface layer that is thinner or lighter in color than that of the Plott soil. They are on south- to west-facing slopes. Chestnut soils are moderately deep over weathered bedrock. Also included are small areas of rock outcrop. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Plott soil but have a dark surface layer that is less than 10 or more than 20 inches thick or have fewer stones on the surface. Where the surface layer is less than 10 inches thick, the soils are on nose slopes or shoulder slopes of the ridges. Where the surface layer is more than 20 inches thick, the soils are in saddles.

Much of the acreage in this map unit is used as woodland. Other uses include pasture, specialty crops, recreational activities, and building site development.

This map unit is only moderately suited to woodland because of the slope. The hazard of erosion and an equipment limitation are moderate management concerns. Difficult access across steep terrain also is a management concern in some areas. This soil is desirable for timber production because of high productivity and valuable species. It commonly is used for this purpose on National Forest lands. Privately owned areas are rarely used for timber production because of a high potential value for building site development, small size of the areas, and difficult access. The most common trees are northern red oak, black cherry, sweet birch, and sugar maple. Yellow-poplar is common at the lower elevations. Yellow birch, American beech, and eastern hemlock are common at the upper elevations. Scarlet oak, white oak, black oak, and hickory are common on severely high-graded sites. Windblown seeds from such species as yellow-poplar, black locust, sugar maple, eastern hemlock, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good and hardwood seedlings are available. Reforestation of hardwoods occurs dominantly through sprouting. In cutover stands cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

White pine can be successfully established in cleared areas. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

Using heavy equipment only during dry periods or periods when the ground is frozen helps to prevent soil compaction. When the soil is wet, skid trails and unsurfaced roads are slick because of the organic matter content.

This map unit is only moderately suited to summer pasture because of the slope. Stones and the hazard of erosion also are management concerns. Most of the large stones are removed when sod is established. Operating farm equipment is difficult because of the slope. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. The soil warms up late in the spring. Cool season grasses, such as tall fescue and orchardgrass, can provide late season pasture. Keeping the pasture in good condition helps to control erosion.

This map unit is poorly suited to specialty crops because of the slope but is used for landscaping plants and Christmas trees. Limited access across steep terrain, the hazard of erosion, and stones also are management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, and rhododendron. Fraser fir is grown for use as Christmas trees. Most of the large stones are removed when areas of this unit are converted to production of specialty crops. Operating farm equipment is difficult because of the slope. Establishing and maintaining sod

in areas that are not used for crops minimize erosion and help to control runoff.

This map unit is poorly suited to building site development because of the slope and caving of cutbanks but commonly is used for this purpose. Stones, limited access across steep terrain, and the hazard of erosion also are management concerns. Because of cold winter temperatures, building sites are used mainly for summer homes. Revegetating disturbed areas is difficult because of the slope and erosion. Hydroseeding is a good way to revegetate steep banks. This map unit is in areas where the amount of annual rainfall exceeds 70 inches. Revegetating building sites as soon as possible helps to control erosion in these areas.

This map unit is only moderately suited to overlooks and hiking trails because of the slope. It is poorly suited to most other recreational uses because of the slope. The hazard of erosion also is a management concern.

This map unit is not used for row crops because of the slope. Stones and the hazard of erosion also are management concerns.

This map unit is poorly suited to access roads because of the slope. It commonly is used for this purpose, however, because timber production and building site development are important uses. The hazard of erosion is a management concern. Because unsurfaced roads are slick when wet, surfacing is required for year-round use. Building the roadbed on natural soil minimizes slumping. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating areas that have been cut and filled is difficult because of the slope. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIe. Based on northern red oak as the indicator species, the woodland ordination symbol is 5R.

PwE—Plott fine sandy loam, 30 to 50 percent slopes, stony. This map unit consists mainly of steep, very deep, well drained Plott and similar soils on mountainsides and ridgetops in the intermediate mountains. The unit is on north- to east-facing slopes and on south- to west-facing slopes shaded by higher mountains. Individual areas are irregular in shape and range from 5 to 80 acres in size.

The typical sequence, depth, and composition of the layers of the Plott soil are as follows—

Surface layer:

0 to 6 inches, very dark brown fine sandy loam

6 to 14 inches, very dark grayish brown fine sandy loam

Subsoil:

14 to 46 inches, dark yellowish brown fine sandy loam

46 to 62 inches, dark yellowish brown gravelly fine sandy loam

Permeability is moderately rapid. Surface runoff is slow in areas where undisturbed forest litter is on the surface and very rapid in areas without forest litter. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is high or very high. Stones on the surface interfere with tillage unless the larger stones are removed. The soil is frozen for long periods in the winter and warms up later in the spring than other soils at the same elevation.

Included in mapping are small areas of Chestnut, Cullasaja, Edneyville, and Tuckasegee soils. Chestnut and Edneyville soils have a surface layer that is thinner or lighter in color than that of the Plott soil. Also, Chestnut soils are moderately deep over weathered bedrock. Cullasaja soils have more than 35 percent rock fragments in the subsoil. Cullasaja and Tuckasegee soils formed in colluvium. They are in drainageways. Chestnut and Edneyville soils are on south- to west-facing slopes. Also included near ridgetops are small areas of rock outcrop and seeps. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Plott soil but have a dark surface layer that is less than 10 or more than 20 inches thick or have fewer stones on the surface. Where the surface layer is less than 10 inches thick, the soils are on nose slopes or shoulder slopes. Where the surface layer is more than 20 inches thick, the soils are in saddles or on foot slopes.

Much of the acreage in this map unit is used as woodland. Other uses include building site development, pasture, recreational activities, and specialty crops.

This map unit is poorly suited to woodland because of the slope. The hazard of erosion and an equipment limitation are severe management concerns. This unit is desirable for timber production, however, because of high productivity and valuable species. It commonly is used for this purpose on National Forest lands. Privately owned areas are rarely used for timber production because of a high potential value for building site development. The most common trees are northern red oak, black cherry, sweet birch, and sugar maple. Yellow-poplar is common at the lower elevations. Yellow birch, American beech, and eastern hemlock are common at the upper elevations. Scarlet oak, white oak, black oak, and hickory are common on severely high-

graded sites. Windblown seeds from such species as yellow-poplar, black locust, sugar maple, eastern hemlock, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good and hardwood seedlings are available. Reforestation of hardwoods occurs dominantly through sprouting. In cutover stands cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

White pine can be successfully established in cleared areas. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

Using heavy equipment only during dry periods or periods when the ground is frozen helps to prevent soil compaction. When the soil is wet, skid trails and unsurfaced roads are slick because of the organic matter content.

This map unit is poorly suited to building site development because of the slope and caving of cutbanks but is used for this purpose. Stones and the hazard of erosion also are management concerns. Because of cold winter temperatures, building sites are used mainly for summer homes. Revegetating disturbed areas is difficult because of the slope. Hydroseeding is a good way to revegetate steep banks. This map unit is in areas where the amount of annual rainfall exceeds 70 inches. Revegetating building sites as soon as possible helps to control erosion in these areas.

This map unit is poorly suited to pasture because of the slope but is used for this purpose. Stones and the hazard of erosion also are management concerns. Most of the large stones are removed when sod is established. Operating farm equipment is dangerous because of the slope. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Generally, weeds are controlled and fertilizer and lime are applied by hand. The soil warms up late in the spring. Cool season grasses, such as tall fescue and orchardgrass, can provide late season pasture. Keeping the pasture in good condition helps to control erosion.

This map unit is poorly suited to recreational uses because of the slope but in some areas is used for hiking trails. The hazard of erosion also is a management concern.

This map unit is poorly suited to specialty crops because of the slope but is used for landscaping plants and Christmas trees. Stones and the hazard of erosion also are management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, and rhododendron. Fraser fir is grown for use as Christmas trees. Most of the large stones are removed when areas of this unit are converted to production of specialty crops. Operating farm equipment is dangerous because of the slope. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff.

This map unit is not used for row crops because of the slope. Stones and the hazard of erosion also are management concerns.

This map unit is poorly suited to access roads because of the slope. It commonly is used for this purpose, however, because timber production and building site development are important uses. Stones and the hazard of erosion are management concerns. Because unsurfaced roads are slick when wet, surfacing is required for year-round use. Building the roadbed on natural soil minimizes slumping. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating large areas that have been cut and filled is difficult because of the slope. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIIe. Based on northern red oak as the indicator species, the woodland ordination symbol is 5R.

PwF—Plott fine sandy loam, 50 to 95 percent slopes, stony. This map unit consists mainly of very steep, very deep, well drained Plott and similar soils on mountainsides in the intermediate mountains. The unit is on north- to east-facing slopes and on south- to west-facing slopes shaded by higher mountains. Individual areas range from 10 to 150 acres in size.

The typical sequence, depth, and composition of the layers of the Plott soil are as follows—

Surface layer:

0 to 6 inches, very dark brown fine sandy loam

6 to 14 inches, very dark grayish brown fine sandy loam

Subsoil:

14 to 46 inches, dark yellowish brown fine sandy loam

46 to 62 inches, dark yellowish brown gravelly fine sandy loam

Permeability is moderately rapid. Surface runoff is slow in areas where undisturbed forest litter is on the surface and very rapid in areas without forest litter. The

depth to bedrock is more than 60 inches. The organic matter content in the surface layer is high or very high. The soil is frozen for long periods in the winter and warms up later in the spring than other soils on south- to west-facing slopes that are at the same elevation.

Included in mapping are small areas of Chestnut, Cullasaja, Edneyville, and Tuckasegee soils. Chestnut and Edneyville soils have a surface layer that is thinner or lighter in color than that of the Plott soil. Also, Chestnut soils are moderately deep over weathered bedrock. Cullasaja soils have more than 35 percent rock fragments in the subsoil. In Cullasaja and Tuckasegee soils, the underlying material is not saprolite. These soils are in drainageways. Chestnut and Edneyville soils are on south- to west-facing spur ridges. Also included near ridges are small areas of rock outcrop and seeps. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Plott soil but have a dark surface layer that is less than 10 or more than 20 inches thick or have fewer stones on the surface. Where the surface layer is less than 10 inches thick, the soils are on nose slopes or shoulder slopes of the ridges. Where the surface layer is more than 20 inches thick, the soils are on foot slopes.

Nearly all of the acreage in this map unit is used as woodland.

This map unit is poorly suited to woodland because of the slope. The hazard of erosion and an equipment limitation are severe management concerns. This unit is desirable for timber production, however, because of high productivity and valuable species. It commonly is used for this purpose on National Forest lands. The most common trees are northern red oak, black cherry, sweet birch, and sugar maple. Yellow-poplar is common at the lower elevations. Yellow birch, American beech, and eastern hemlock are common at the upper elevations. Scarlet oak, white oak, black oak, and hickory are common on severely high-graded sites.

Hardwoods are preferred for timber production. Plant competition is moderate. Reforestation of hardwoods occurs dominantly through sprouting. In cutover stands cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

Using heavy equipment only during dry periods or periods when the ground is frozen helps to prevent soil compaction. The slope restricts the kinds of equipment that can be used. Generally, operating wheeled or tracked equipment is dangerous because of the slope. Cable yarding is safer, disturbs the soil less, and helps to maintain productivity. It is used by the U.S. Forest Service.

This map unit generally is not used for pasture, building site development, recreational activities, or crops. The slope is the main limitation. The hazard of erosion also is a management concern.

This map unit is poorly suited to access roads because of the slope. It is used for this purpose, however, because timber production is a use. Because unsurfaced roads are slick when wet, surfacing is required for year-round use. Building the roadbed on natural soil minimizes slumping. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating large areas that have been cut and filled is difficult because of the slope. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIIe. Based on northern red oak as the indicator species, the woodland ordination symbol is 5R.

ReA—Reddies fine sandy loam, 0 to 3 percent slopes, frequently flooded. This map unit consists mainly of nearly level and gently sloping, very deep, moderately well drained Reddies and similar soils on flood plains along small streams. The unit is in slightly elevated areas beside the stream channel. Individual areas are long bands and range from 1 to 25 acres in size.

The typical sequence, depth, and composition of the layers of the Reddies soil are as follows—

Surface layer:
- 0 to 12 inches, dark brown fine sandy loam

Subsoil:
- 12 to 20 inches, dark yellowish brown fine sandy loam
- 20 to 26 inches, yellowish brown fine sandy loam

Underlying material:
- 26 to 35 inches, mottled dark grayish brown and yellowish brown loamy sand
- 35 to 60 inches, multicolored very cobbly sand

Permeability is moderately rapid in the surface layer and subsoil and rapid or very rapid in the underlying material. Surface runoff is slow. The soil is frequently flooded for very brief periods. The seasonal high water table is 2.0 to 3.5 feet below the surface. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is moderate or high.

Included in mapping are small areas of Dellwood, Nikwasi, Rosman, and Saunook soils. Dellwood soils are shallow to strata of cobbles, gravel, and sand. Nikwasi soils are poorly drained and very poorly

drained. Rosman soils are deep to strata of cobbles, gravel, and sand. Saunook soils have more clay in the subsoil than the Reddies soil. They are not subject to flooding. Dellwood soils are in areas scoured by floodwater or in areas where smaller streams cross the unit. Nikwasi soils are in depressions. Rosman soils are on small, elevated knolls. Saunook soils are on toe slopes. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Reddies soil but have a lighter colored surface layer or a redder subsoil.

Much of the acreage in this map unit is used as pasture or hayland. Other uses include row crops, specialty crops, building site development, and woodland.

This map unit is well suited to pasture and hay. The flooding, compaction, and damage to streambanks are management concerns. Grazing during wet periods causes compaction, increases the hazard of ponding, and reduces the rate of water infiltration. Properly locating watering facilities, stream crossings, and fences can help to prevent damage to streambanks and improve water quality.

This map unit is only moderately suited to row crops because of the flooding. Runoff from the adjacent higher areas and frost also are management concerns. Frost damage to sensitive crops can be significant because of poor air drainage. This soil is preferred for row crops because it has good access, is near a source of irrigation water, is nearly level, and has good productivity. The most common crops are corn for silage, sweet corn, tomatoes, strawberries, and burley tobacco. Early planting allows some crops, such as tomatoes, to be harvested before crops grown farther north. Split applications of fertilizer are needed because nutrients are easily leached. Properly designed plowing patterns are needed to keep drainage outlets open and to prevent the formation of depressions. Land shaping helps to open outlets and drain surface water from depressions. Irrigation is used to protect high-value crops from frost and to supply supplemental water. Mulch is used in areas where strawberries are grown. It holds moisture, controls weeds, and keeps the berries clean. Grassed field borders and grassed waterways can safely divert runoff. Herbicides may be ineffective because of a high content of organic matter. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat.

This map unit is only moderately suited to specialty crops because of the flooding. It commonly is used for landscaping plants, Christmas trees, and seedlings. Runoff from the adjacent higher areas is a management concern. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, dogwood, dog hobble, white birch, and rhododendron. Fraser fir and eastern white pine are grown for use as Christmas trees. Trees and other plants can be dug and balled and burlapped. Seedlings of the landscaping plants and Fraser fir can be grown. They can be easily pulled out of the soil without damage to roots because of the sandy texture of the soil. Grassed field borders and grassed waterways can divert water from the higher areas safely around crops.

This map unit is poorly suited to building site development because of the flooding, the wetness, caving of cutbanks, and poor filtering. Some areas have been filled and used for this purpose, however, because the unit is near streams.

This map unit is well suited to woodland. It is rarely used for timber production, however, because of the small size of the areas and the higher profits from crops, pasture, and hayland. Yellow-poplar is the most common tree. Other trees include sweet birch, black cherry, eastern hemlock, and American sycamore. Black walnut grows well on this soil.

This map unit is moderately suited or poorly suited to most recreational uses because of the flooding. Because of the nearly level terrain and the proximity to streams, however, it is used for camp sites, parks, picnic areas, ball fields, or tennis courts.

This map unit is poorly suited to access roads because of the flooding. It is used for this purpose, however, because building site development, camp sites, and parks are important uses. Runoff from the adjacent higher areas is a management concern. Elevating roads during construction minimizes the damage caused by flooding. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. The roads should be designed so that runoff is diverted. Wet spots are a management concern.

The capability subclass is IIIw. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8A.

RhF—Rock outcrop-Cataska complex, 30 to 95 percent slopes. This steep and very steep map unit occurs mainly as areas of Rock outcrop and areas of a shallow, excessively drained Cataska soil. The unit is on side slopes in the intermediate mountains. Nearly all areas of the unit are along the Nantahala River in the northwestern part of the county. The slope is generally more than 70 percent. Individual areas range from 20 to 100 acres in size. Typically, they are 50 to 60 percent Rock outcrop and 25 to 35 percent Cataska soil. The Rock outcrop and Cataska soil occur as areas too

intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Cataska soil are as follows—

Surface layer:
0 to 6 inches, dark brown very channery loam

Subsoil:
6 to 16 inches, dark yellowish brown very channery loam

Weathered bedrock:
16 to 30 inches, multicolored slate

Hard bedrock:
30 inches, slate

Permeability is moderately rapid in the Cataska soil. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to weathered bedrock is 10 to 20 inches. The organic matter content in the surface layer ranges from low to moderate. Available water capacity is very low. Underlying seams of ultra acid, sulfur-bearing rock are common. Mass movement occurs when the soil slides off the rock contact or the rock shears along planes of weakness during the wet season.

Included in mapping are small areas of Cheoah, Soco, and Spivey soils. Cheoah soils are deep, Soco soils are moderately deep, and Spivey soils are very deep. Cheoah and Spivey soils have a thicker, darker surface layer than that of the Cataska soil. Cheoah soils are on north- to east-facing slopes. Soco soils are on foot slopes. Spivey soils are in drainageways. Also included are small areas of rubble land where more than 75 percent of the surface is covered by stones and boulders. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Cataska soil but have a redder subsoil or fewer rock fragments.

All of the acreage in this map unit is wooded. In most areas traversing the landscape is difficult and dangerous.

This map unit is not used for commercial timber production. Trees are stunted, twisted, or otherwise damaged by wind and ice. The slope, the depth to bedrock, numerous areas of Rock outcrop, and the hazard of erosion are management concerns. The most common trees on south- to west-facing slopes are scarlet oak, chestnut oak, eastern white pine, pitch pine, Virginia pine, and hickory. The most common trees on north- to east-facing slopes are northern red oak, sweet birch, and eastern hemlock.

This map unit is not used for recreational activities, pasture, building site development, access roads, or crops. It is impractical for these uses because of the slope, the depth to bedrock, and the numerous areas of Rock outcrop.

The capability subclass is VIIe in areas of the Cataska soil and VIIIs in areas of the Rock outcrop. Based on chestnut oak as the indicator species, the woodland ordination symbol is 2R in areas of the Cataska soil. The Rock outcrop has not been assigned a woodland ordination symbol.

RkF—Rock outcrop-Cleveland complex, windswept, 30 to 95 percent slopes. This steep and very steep map unit occurs mainly as areas of Rock outcrop and areas of a shallow, somewhat excessively drained Cleveland soil. The unit is on side slopes in the intermediate mountains. Individual areas range from 20 to 100 acres in size. Typically, they are 50 to 60 percent Rock outcrop and 25 to 35 percent Cleveland soil. The Rock outcrop and Cleveland soil occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Cleveland soil are as follows—

Surface layer:
0 to 5 inches, black sandy loam

Subsoil:
5 to 9 inches, dark yellowish brown loam
9 to 17 inches, yellowish brown loam

Hard bedrock:
17 inches, granite

Permeability is moderately rapid in the Cleveland soil. Surface runoff is slow in areas where undisturbed forest litter is on the surface and very rapid in areas without forest litter. The depth to hard bedrock is 10 to 20 inches. The organic matter content in the surface layer ranges from low to high. Available water capacity is very low. Landslides are common when the soil slides off the rock contact during the wet season.

Included in mapping are small areas of Chestnut, Cullasaja, and Plott soils. Chestnut soils are moderately deep over weathered bedrock. Cullasaja and Plott soils are very deep. They have a thicker dark surface layer than the Cleveland soil. Cullasaja soils have more than 35 percent rock fragments in the subsoil. Chestnut soils are on south- to west-facing slopes. Cullasaja soils are in drainageways. Plott soils are on north- to east-facing slopes. Also included are small areas of rubble land where more than 75 percent of the surface is covered by stones and boulders. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are

similar to the Cleveland soil but have a redder subsoil or more stones on the surface.

Nearly all of the acreage in this map unit is wooded. In most areas traversing the landscape is difficult and dangerous.

This map unit is poorly suited to woodland because of the severe climatic conditions, which cause low productivity. The unit is not used for commercial timber production. Trees are stunted, twisted, or otherwise damaged by wind and ice. The slope, the depth to bedrock, numerous areas of Rock outcrop, and the hazard of erosion are management concerns. The most common trees on south- to west-facing slopes are scarlet oak, chestnut oak, eastern white pine, pitch pine, Virginia pine, and hickory. The most common trees on north- to east-facing slopes are northern red oak, sweet birch, and eastern hemlock.

This map unit is poorly suited to recreational uses but in some areas is used for overlooks. The slope, the depth to bedrock and the numerous areas of Rock outcrop are management concerns.

This map unit is not used for pasture, building site development, or crops. It is impractical for these uses because of the slope, the depth to bedrock, and the numerous areas of Rock outcrop.

This map unit is not used for access roads. The slope, the depth to bedrock, the numerous areas of Rock outcrop, and the hazard of erosion are severe management concerns. Building and maintaining roads are almost always too costly. Drilling and blasting of the hard bedrock are needed. Building the roadbed on natural soil minimizes slumping.

The capability subclass is VIIIs in areas of the Rock outcrop and VIIe in areas of the Cleveland soil. Based on northern red oak as the indicator species, the woodland ordination symbol is 2R in areas of the Cleveland soil. The Rock outcrop has not been assigned a woodland ordination symbol.

RsA—Rosman fine sandy loam, 0 to 2 percent slopes, frequently flooded. This map unit consists mainly of nearly level, very deep, well drained Rosman and similar soils in slightly elevated areas on flood plains. The unit is along major streams and next to natural levees of sand along the inside of the curve at the bends of the stream. Individual areas are long bands and range from 5 to 40 acres in size.

The typical sequence, depth, and composition of the layers of the Rosman soil are as follows—

Surface layer:
0 to 16 inches, dark brown fine sandy loam

Subsoil:
16 to 57 inches, strong brown loam

Underlying material:
57 to 60 inches, strong brown fine sandy loam

Permeability is moderately rapid. Surface runoff is slow. Ponding occurs in concave areas where outlets have been blocked. The soil is frequently flooded for very brief periods. The seasonal high water table is 3.5 to 5.0 feet below the surface. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is moderate or high.

Included in mapping are small areas of Arkaqua, Biltmore, Reddies, Statler, and Toxaway soils. Arkaqua soils are somewhat poorly drained. Biltmore soils have a sandy subsoil. Reddies soils are moderately deep to strata of cobbles, gravel, and sand. Statler soils are rarely flooded. Toxaway soils are poorly drained and very poorly drained. Arkaqua and Toxaway soils are in depressions. Biltmore soils are along stream channels. Reddies soils are in areas scoured by floodwater or in areas where smaller streams cross the unit. Statler soils are on small knolls. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Rosman soil but have a lighter colored surface layer or a redder subsoil.

Much of the acreage in this map unit is used as pasture or hayland. Other uses include row crops, specialty crops, recreational activities, and woodland.

This map unit is well suited to pasture and hay. The flooding, compaction, and damage to streambanks are management concerns. Grazing during wet periods causes compaction, increases the hazard of ponding, and reduces the rate of water infiltration. Properly locating watering facilities, stream crossings, and fences can help to prevent damage to streambanks and improve water quality.

This map unit is only moderately suited to row crops because of the flooding. Droughtiness, ponding, runoff from the adjacent higher areas, and frost are additional management concerns. Frost damage to sensitive crops can be significant because of poor air drainage. This map unit is preferred for row crops because it has very good access, is near a source of irrigation water, is nearly level, and has very good productivity if properly fertilized and irrigated. The most common crops are corn for silage, sweet corn, tomatoes, strawberries, and burley tobacco. Early planting allows some crops, such as tomatoes, to be harvested before crops grown farther north. Split applications of fertilizer are needed because nutrients are easily leached. Properly designed plowing patterns are needed to keep drainage outlets open and to prevent the formation of depressions that pond water. Land shaping helps to open outlets and drain surface water from depressions. Irrigation is used

to protect high-value crops from frost and to supply supplemental water. Mulch is used in areas where strawberries are grown. It holds moisture, controls weeds, and keeps the berries clean. Grassed field borders and grassed waterways can divert water from the higher areas around row crops. Herbicides may be ineffective because of a high content of organic matter. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat.

This map unit is only moderately suited to specialty crops because of the flooding. It commonly is used for landscaping plants, Christmas trees, and seedlings. Runoff from the adjacent higher areas is a management concern. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, dogwood, dog hobble, white birch, and rhododendron. Fraser fir is grown for use as Christmas trees. Trees and other plants are easily dug and balled and burlapped. This unit is used for seedlings of landscaping plants and Fraser fir. Seedlings can be pulled out of the soil without damage to the roots. Water management practices similar to those used for row crops are appropriate.

This map unit is poorly suited to building site development because of the flooding, the wetness, and caving of cutbanks. It is filled and used for this purpose, however, because it is near streams.

This map unit is moderately suited or poorly suited to most recreational uses because of the flooding. Because of the nearly level terrain and the proximity to streams, however, it commonly is used for camp sites, parks, picnic areas, ball fields, or tennis courts.

This map unit is well suited to woodland. It is rarely used for timber production, however, because of the small size of the areas and the higher profits from crops, pasture, and hayland. Yellow-poplar is the most common tree. Other trees include river birch, black cherry, and American sycamore. Black walnut grows well on this soil.

This map unit is poorly suited to access roads because of the flooding. It is used for this purpose, however, because building site development, camp sites, and parks are important uses. Runoff from the adjacent higher areas is a management concern. Elevating roads during construction minimizes the damage caused by flooding. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. The roads should be designed so that runoff from the adjacent higher areas is diverted. Wet spots are a management concern.

The capability subclass is IIIw. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8A.

SbC—Saunook gravelly loam, 8 to 15 percent slopes, stony. This map unit consists mainly of strongly sloping, very deep, well drained Saunook and similar soils in coves and on benches and toe slopes in the low mountains. The unit is in elevated areas between streams or on the toe slopes. Scattered stones and boulders are on the surface. Areas in the coves are bowl shaped in the lower part and extend as narrow bands along drainageways. Areas on the toe slopes and the benches are long and narrow. Individual areas range from 3 to 30 acres in size.

The typical sequence, depth, and composition of the layers of the Saunook soil are as follows—

Surface layer:
0 to 10 inches, dark brown gravelly loam

Subsoil:
10 to 34 inches, strong brown clay loam
34 to 44 inches, dark yellowish brown cobbly fine sandy loam

Underlying material:
44 to 60 inches, dark yellowish brown very cobbly fine sandy loam

Permeability is moderate. Surface runoff is slow in areas where undisturbed forest litter is on the surface and medium in areas without forest litter. Runoff from the adjacent higher areas is concentrated in concave areas. The seasonal high water table is more than 6 feet below the surface. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is moderate or high. Many cobbles and pebbles are in the soil.

Included in mapping are small areas of Cullasaja, Nikwasi, Reddies, and Whiteside soils. Cullasaja soils have more than 35 percent rock fragments in the subsoil. Nikwasi and Reddies soils are subject to flooding. Whiteside soils are moderately well drained. Cullasaja, Nikwasi, and Reddies soils are along streams. Whiteside soils are in depressions. Also included are springs and seeps. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Saunook soil but have a redder subsoil, a seasonal high water table 3 to 6 feet below the surface, or 3 to 10 inches of recent overwash.

Much of the acreage in this map unit is used as pasture or hayland. Other uses include woodland, building site development, specialty crops, recreational activities, and row crops.

This map unit is well suited to pasture and hay. Stones, compaction, the hazard of erosion, damage to streambanks, and runoff from the adjacent higher areas are management concerns. Most of the large stones are

removed when sod is established. Seedbed preparation is a management concern because of the cobbles and pebbles in the soil. Grazing during wet periods causes compaction and reduces the rate of water infiltration. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Properly locating watering facilities, stream crossings, and fences can help to prevent damage to streambanks and improve water quality. Keeping the pasture and hayland in good condition can help to control erosion.

This map unit is well suited to woodland. It is desirable for timber production because of high productivity and valuable species. The slope, the hazard of erosion, and runoff from the adjacent higher areas are management concerns. This soil commonly is used for timber production on National Forest lands. Privately owned areas are rarely used for timber production because building site development is an important use. Yellow-poplar is the most common tree. Other trees include black cherry, American beech, sweet birch, northern red oak, sugar maple, and yellow buckeye. Windblown seeds from such species as yellow-poplar, black locust, red maple, eastern hemlock, and eastern white pine reforest old fields.

Hardwoods are favored except where cleared areas are being converted to woodland. Reforestation of hardwoods occurs dominantly through sprouting. In cutover stands cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

White pine can be successfully established in cleared areas. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

Care is needed to prevent soil compaction. The use of heavy equipment should be restricted to dry periods or to periods when the ground is frozen. When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick because of the high content of organic matter and clay.

This map unit is only moderately suited to building site development because of the slope and the restricted permeability. It commonly is used for this purpose because it is commonly near small streams and is crossed by many roads in the county. Stones, runoff from the adjacent higher areas, and the hazard of erosion are management concerns. A water table may be at a depth of 6 to 10 feet. Excavation for dwellings with basements is hampered by underground water in some areas. A drainage system is needed in these areas. Building sites should be designed so that runoff is diverted. Water from seeps and springs also should be diverted. Sites that are wet because of seeps, springs, or runoff should not be used for septic tank absorption fields.

This map unit is only moderately suited to specialty crops because of the hazard of erosion. It is used for landscaping plants, apples, Christmas trees, and ginseng. Stones, the slope, runoff from the adjacent higher areas, and frost are management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, dogwood, white birch, and rhododendron. Fraser fir and eastern white pine are grown for use as Christmas trees. Most of the large stones are removed when areas of this unit are converted to cropland. Preparing a plant bed and harvesting plants remain difficult because of the many cobbles and pebbles in the soil. Areas of this unit on toe slopes have better air drainage than the other areas of this unit and thus are better suited to frost-sensitive crops, such as apples. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff.

This map unit is only moderately suited to most recreational uses because of the slope. It is used for camp sites and trailer parks because it is commonly near small streams, is shaded in many areas, and is crossed by many roads in the county. Stones and the hazard of erosion are management concerns. Water sources, such as springs, are common in areas of this unit.

This map unit is only moderately suited to row crops because of the hazard of erosion. Stones, the slope, runoff from the adjacent higher areas, and frost also are management concerns. Tillage is impractical unless the larger stones on the surface are removed. The most common crops are tomatoes, strawberries, and burley tobacco. Areas of this unit on toe slopes have better air drainage than the other areas of this unit and thus are better suited to frost-sensitive crops, such as tomatoes and strawberries. Irrigation is used to protect high-value crops from frost and to supply supplemental water. Mulch is used in areas where strawberries are grown. It holds moisture, controls weeds, and keeps the berries clean. Grassed field borders and grassed waterways can safely divert runoff. Herbicides may be ineffective because of a high content of organic matter. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat.

This map unit is only moderately suited to access roads because of the slope and frost action. The U.S. Forest Service generally does not use areas of this map

unit for access roads, but some areas are crossed by short sections of roads perpendicular to streams. Privately owned areas are commonly used for this purpose because building site development is an important use. The hazard of erosion, springs and seeps, and runoff from the adjacent higher areas are management concerns. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. Building the roads in upslope areas near the uplands helps to avoid the springs and the seeps. The roads should be designed so that runoff from the adjacent higher areas is diverted. Water from seeps and springs should be diverted to outlets. The number of culverts needed per mile of road is very high compared to the number needed on soils in the uplands. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality.

The capability subclass is IVe. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8A.

SbD—Saunook gravelly loam, 15 to 30 percent slopes, stony. This map unit consists mainly of moderately steep, very deep, well drained Saunook and similar soils in coves and on toe slopes in the low mountains. Scattered stones and boulders are on the surface. Areas in the coves are bowl shaped in the lower part and extend as narrow bands along drainageways. Areas on the toe slopes are long and narrow. Individual areas range from 4 to 30 acres in size.

The typical sequence, depth, and composition of the layers of the Saunook soil are as follows—

Surface layer:

0 to 10 inches, dark brown gravelly loam

Subsoil:

10 to 34 inches, strong brown clay loam

34 to 44 inches, dark yellowish brown cobbly fine sandy loam

Underlying material:

44 to 60 inches, dark yellowish brown very cobbly fine sandy loam

Permeability is moderate. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. Runoff from the adjacent higher areas is concentrated in concave areas. The seasonal high water table is more than 6 feet below the surface. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is moderate or high. Many cobbles and pebbles are in the soil.

Included in mapping are small areas of Cowee, Cullasaja, Evard, and Whiteside soils. Cowee and Evard soils have a surface layer that is thinner or lighter in color than that of the Saunook soil. Also, Cowee soils are moderately deep over weathered bedrock. Cullasaja soils have more than 35 percent rock fragments in the subsoil. Whiteside soils are moderately well drained. Cowee and Evard soils are on small knolls. Cullasaja soils are along streams. Whiteside soils are in depressions. Also included are springs and seeps. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Saunook soil but have a redder subsoil, a seasonal high water table 3 to 6 feet below the surface, or 3 to 10 inches of recent overwash.

Much of the acreage in this map unit is used as woodland. Other uses include pasture, building site development, specialty crops, and recreational activities.

This map unit is only moderately suited to woodland because of the slope. The hazard of erosion and an equipment limitation are moderate management concerns. Runoff from the adjacent higher areas also is a management concern. This unit is desirable for timber production, however, because of high productivity and valuable species. It commonly is used for timber production on National Forest lands. Privately owned areas are rarely used for timber production because building site development is an important use. Yellow-poplar is the most common tree. Other trees include black cherry, American beech, sweet birch, northern red oak, sugar maple, and yellow buckeye. Windblown seeds from such species as yellow-poplar, black locust, red maple, eastern hemlock, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production, except where cleared areas are being converted to woodland. Reforestation of hardwoods occurs dominantly through sprouting. In cutover stands cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

White pine can be successfully established in cleared areas. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

Care is needed to prevent soil compaction. The use of heavy equipment should be restricted to dry periods or to periods when the ground is frozen. When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick because of the high content of organic matter and clay.

This map unit is only moderately suited to pasture because of the slope. Stones, compaction, the hazard of erosion, damage to streambanks, and runoff from the adjacent higher areas also are management concerns. Most of the large stones are removed when sod is established. Operating farm equipment is difficult because of the slope. Seedbed preparation is a management concern because of the cobbles and pebbles in the soil. Grazing during wet periods causes compaction and reduces the rate of water infiltration. Erosion is a hazard in sparsely vegetated or overgrazed areas. Properly locating watering facilities, stream crossings, and fences can help to prevent damage to streambanks and improve water quality.

This map unit is poorly suited to building site development because of the slope. It commonly is used for this purpose, however, because it is commonly near small streams and is crossed by many roads in the county. Stones, runoff from the adjacent higher areas, and the hazard of erosion also are management concerns. A water table may be at a depth of 6 to 10 feet. Excavation for dwellings with basements is hampered by underground water in some areas. A drainage system is needed in these areas. Building sites should be designed so that runoff is diverted. Water from seeps and springs also should be diverted. Sites that are wet because of seeps, springs, or runoff should not be used for septic tank absorption fields.

This map unit is poorly suited to specialty crops because of the hazard of erosion but is used for landscaping plants, apples, Christmas trees, and ginseng. Stones, the slope, runoff from the adjacent higher areas, and frost also are management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, dogwood, white birch, and rhododendron. Fraser fir and eastern white pine are grown for use as Christmas trees. Most of the large stones are removed when areas of this unit are converted to cropland. Preparing a plant bed and harvesting plants remains difficult because of the many cobbles and pebbles in the soil. Operating farm equipment is difficult because of the slope. Areas of this unit on toe slopes have better air drainage than the other areas of this unit and thus are better suited to frost-sensitive crops, such as apples. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff.

This map unit is moderately suited or poorly suited to recreational uses because of the slope. It is used for camp sites and hiking trails. The hazard of erosion is a management concern. Water sources, such as springs, are common in areas of this unit.

This map unit is not used for row crops because of the slope. Stones, the hazard of erosion, and runoff from the adjacent higher areas also are management concerns. Tillage is impractical unless the larger stones on the surface are removed.

This map unit is poorly suited to access roads because of the slope. The U.S. Forest Service generally does not use areas of this map unit for access roads, but some areas are crossed by short sections of roads perpendicular to streams. Privately owned areas are commonly used for this purpose because building site development is an important use. The hazard of erosion, springs and seeps, and runoff from the adjacent higher areas are management concerns. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. Building the roads in upslope areas near the uplands helps to avoid the springs and the seeps. The roads should be designed so that runoff from the adjacent higher areas is diverted. Water from seeps and springs should be diverted to outlets. The number of culverts needed per mile of road is very high compared to the number needed on soils in the uplands. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating areas that have been cut and filled is difficult because of the slope. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIe. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8R.

SbE—Saunook gravelly loam, 30 to 50 percent slopes, stony. This map unit consists mainly of steep, very deep, well drained Saunook and similar soils in coves at the headwaters of drainageways in the low mountains. Scattered stones and boulders are on the surface. Individual areas are bowl shaped in the lower part, extend as narrow bands along drainageways, and range from 5 to 30 acres in size.

The typical sequence, depth, and composition of the layers of the Saunook soil are as follows—

Surface layer:

0 to 10 inches, dark brown gravelly loam

Subsoil:

10 to 34 inches, strong brown clay loam

34 to 44 inches, dark yellowish brown cobbly fine sandy loam

Underlying material:

44 to 60 inches, dark yellowish brown very cobbly fine sandy loam

Permeability is moderate. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. Runoff from the adjacent higher areas is concentrated in concave areas. The seasonal high water table is more than 6 feet below the surface. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is moderate or high. Many cobbles and pebbles are in the soil.

Included in mapping are small areas of Cowee, Cullasaja, and Evard soils. Cowee and Evard soils have a surface layer that is thinner or lighter in color than that of the Saunook soil. Also, Cowee soils are moderately deep over weathered bedrock. Cullasaja soils have more than 35 percent rock fragments in the subsoil. Cowee and Evard soils are on small knolls. Cullasaja soils are along streams. Also included are springs and seeps. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Saunook soil but have a redder subsoil or a seasonal high water table 3 to 6 feet below the surface.

Most of the acreage in this map unit is used as woodland. Some areas are used for building site development.

This map unit is poorly suited to woodland because of the slope. The hazard of erosion and an equipment limitation are severe management concerns. Runoff from the adjacent higher areas also is a management concern. This unit is desirable for timber production, however, because of high productivity and valuable species. It commonly is used for timber production on National Forest lands. Yellow-poplar is the most common tree. Other trees include black cherry, American beech, yellow buckeye, eastern hemlock, and eastern white pine at the lower elevations and black cherry, sweet birch, northern red oak, and sugar maple at the higher elevations. Windblown seeds from such species as yellow-poplar, black locust, red maple, eastern hemlock, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production. Reforestation of hardwoods occurs dominantly through sprouting. Cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

Care is needed to prevent soil compaction. Using wheeled and tracked equipment is difficult because of the slope. The use of heavy equipment should be restricted to dry periods or to periods when the ground is frozen. When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick because of the high content of organic matter and clay.

This map unit is poorly suited to building site development because of the slope but is desirable for this use because it is commonly near small streams and is crossed by many roads in the county. Stones, runoff from the adjacent higher areas, and the hazard of erosion are management concerns. A water table may be at a depth of 6 to 10 feet. Excavation for dwellings with basements is hampered by underground water in some areas. A drainage system is needed in these areas. Building sites should be designed so that runoff from the adjacent higher areas is diverted. Water from seeps and springs also should be diverted. Septic tank absorption fields should be dug by hand because of the slope. Sites that are wet because of seeps, springs, or runoff should not be used for septic tank absorption fields. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating large areas that have been cut and filled is difficult because of the slope. Hydroseeding is a good way to revegetate steep banks.

This map unit is not used for pasture or crops because of the slope. Tillage is impractical unless the larger stones on the surface are removed.

This map unit is poorly suited to recreational uses because of the slope but is used for hiking trails. Stones and the hazard of erosion also are management concerns.

This map unit is poorly suited to access roads because of the slope. The U.S. Forest Service generally does not use areas of this map unit for access roads, but some areas are crossed by short sections of roads perpendicular to streams. Privately owned areas are commonly used for this purpose because building site development is an important use. The hazard of erosion, springs and seeps, and runoff from the adjacent higher areas are management concerns. Building and maintaining roads are difficult and expensive. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. Building the roads in upslope areas near the uplands helps to avoid the springs, the seeps, and the large stones. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating large areas that have been cut and filled is difficult because of the

slope. Hydroseeding is a good way to revegetate steep roadbanks. The roads should be designed so that runoff from the adjacent higher areas is diverted. Water from seeps and springs should be diverted to outlets. The number of culverts needed per mile of road is very high compared to the number needed on soils in the uplands.

The capability subclass is VIIe. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8R.

ScB—Saunook loam, 2 to 8 percent slopes. This map unit consists mainly of gently sloping, very deep, well drained Saunook and similar soils in coves, in drainageways, and on toe slopes in the low mountains. Areas in the coves are bowl shaped in the lower part and extend as narrow bands along drainageways. Areas on the toe slopes are long and narrow. Individual areas range from 1 to 40 acres in size.

The typical sequence, depth, and composition of the layers of the Saunook soil are as follows—

Surface layer:
0 to 8 inches, dark brown loam

Subsoil:
8 to 30 inches, strong brown clay loam
30 to 50 inches, strong brown loam

Underlying material:
50 to 60 inches, strong brown fine sandy loam

Permeability is moderate. Surface runoff is slow in areas where undisturbed forest litter is on the surface and medium in areas without forest litter. Runoff from the adjacent higher areas is concentrated in concave areas. The seasonal high water table is more than 6 feet below the surface. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is moderate or high.

Included in mapping are small areas of Dellwood, Nikwasi, Reddies, and Whiteside soils. Dellwood soils have more than 35 percent rock fragments in the subsoil. Dellwood, Nikwasi, and Reddies soils are subject to flooding. Dellwood and Whiteside soils are moderately well drained. Nikwasi soils are poorly drained. Dellwood, Nikwasi, and Reddies soils are along streams. Whiteside soils are in depressions. Also included are springs and seeps. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Saunook soil but have a redder subsoil, a seasonal high water table 3 to 6 feet below the surface, or 3 to 10 inches of recent overwash.

Much of the acreage in this map unit is used as pasture or hayland. Other uses include row crops, specialty crops, building site development, recreational activities, and woodland.

This map unit is well suited to pasture and hay. Soil compaction, the hazard of erosion, and damage to streambanks are management concerns. Grazing during wet periods causes compaction and reduces the rate of water infiltration. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Properly locating watering facilities, stream crossings, and fences can help to prevent damage to streambanks and improve water quality. Keeping the pasture and hayland in good condition can help to control erosion.

This map unit is well suited to row crops. The slope, the hazard of erosion, runoff from the adjacent higher areas, and frost are management concerns. The most common crops are corn for silage, sweet corn, tomatoes, strawberries, and burley tobacco. Areas of this unit on toe slopes have better air drainage than the other areas of this unit and thus are better suited to frost-sensitive crops, such as tomatoes and strawberries. Irrigation is used to protect high-value crops from frost and to supply supplemental water. Mulch is used in areas where strawberries are grown. It holds moisture, controls weeds, and keeps the berries clean. Grassed field borders and grassed waterways can safely divert runoff. Herbicides may be ineffective because of a high content of organic matter. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat.

This map unit is well suited to specialty crops, such as landscaping plants, apples, Christmas trees, and ginseng. It has good yields, is gently sloping, and is desirable for seedlings. The slope, the hazard of erosion, runoff from the adjacent higher areas, and frost are management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, dogwood, white birch, and rhododendron. Fraser fir is grown for use as Christmas trees. Trees and other plants are easily dug and balled and burlapped. Areas of this unit on toe slopes have better air drainage than the other areas of this unit and thus are better suited to frost-sensitive crops, such as apples. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff. Mulch can be used to help control erosion in cultivated areas where sod cannot be used.

This map unit is well suited to building site development. This unit is desirable for building sites because it is commonly near small streams and is crossed by many roads in the county. Runoff from the adjacent higher areas and the hazard of erosion are management concerns. Restricted permeability is a moderate limitation on sites for septic tank absorption

fields. A water table may be at a depth of 6 to 10 feet. Excavation for dwellings with basements is hampered by underground water in some areas. A drainage system is needed in these areas. Building sites should be designed so that runoff is diverted. Water from seeps and springs also should be diverted. Sites that are wet because of seeps, springs, or runoff should not be used for septic tank absorption fields.

This map unit is well suited to recreational uses, such as camp sites and trailer parks. It is desirable to campers because it is commonly near small streams, is shaded in many areas, and is crossed by many roads in the county. The slope and the hazard of erosion are management concerns. Water sources, such as springs, are common in areas of this unit.

This map unit is well suited to woodland. It is desirable for timber production because of high productivity and valuable species. The slope, the hazard of erosion, and runoff from the adjacent higher areas are management concerns. Very little of this map unit is on National Forest lands. Privately owned areas are rarely used for timber production because of the higher profits from building site development. Yellow-poplar is the most common tree. Other trees include black cherry, American beech, sweet birch, northern red oak, and yellow buckeye. Black walnut grows well on this soil. Windblown seeds from such species as yellow-poplar, black locust, red maple, eastern hemlock, and eastern white pine reforest old fields.

This map unit is well suited to access roads. It is preferred for this use because it is not subject to flooding and allows easy connection to county roads. Runoff from the adjacent higher areas and the hazard of erosion are management concerns. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. The roads should be designed so that runoff from the adjacent higher areas is diverted. Water from seeps and springs should be diverted to outlets. The number of culverts needed per mile of road is very high compared to the number needed on soils in the uplands. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality.

The capability subclass is IIe. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8A.

ScC—Saunook loam, 8 to 15 percent slopes. This map unit consists mainly of strongly sloping, very deep, well drained Saunook and similar soils in coves, in drainageways, and on toe slopes in the low mountains. Areas in the coves are bowl shaped in the lower part and extend as narrow bands along drainageways. Areas on the toe slopes are long and narrow. Individual areas range from 2 to 40 acres in size.

The typical sequence, depth, and composition of the layers of the Saunook soil are as follows—

Surface layer:
0 to 8 inches, dark brown loam

Subsoil:
8 to 30 inches, strong brown clay loam
30 to 50 inches, strong brown loam

Underlying material:
50 to 60 inches, strong brown fine sandy loam

Permeability is moderate. Surface runoff is slow in areas where undisturbed forest litter is on the surface and medium in areas without forest litter. Runoff from the adjacent higher areas is concentrated in concave areas. The seasonal high water table is more than 6 feet below the surface. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is moderate or high.

Included in mapping are small areas of Dellwood, Nikwasi, Reddies, and Whiteside soils. Dellwood soils have more than 35 percent rock fragments in the subsoil. Dellwood, Nikwasi, and Reddies soils are subject to flooding. Dellwood and Whiteside soils are moderately well drained. Nikwasi soils are poorly drained. Dellwood, Nikwasi, and Reddies soils are along streams. Whiteside soils are in depressions. Also included are springs and seeps. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Saunook soil but have a redder subsoil, a seasonal high water table 3 to 6 feet below the surface, or 3 to 10 inches of recent overwash.

Much of the acreage in this map unit is used as pasture or hayland. Other uses include row crops, woodland, building site development, recreational activities, and specialty crops.

This map unit is well suited to pasture and hay. Soil compaction, the hazard of erosion, and damage to streambanks are management concerns. Grazing during wet periods causes compaction and reduces the rate of water infiltration. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Properly locating watering facilities, stream crossings, and fences can help to prevent damage to streambanks and improve water quality. Keeping the pasture and hayland in good condition can help to control erosion.

This map unit is only moderately suited to row crops because of the hazard of erosion. The slope, runoff from the adjacent higher areas, and frost also are

management concerns. The most common crops are corn for silage, sweet corn, tomatoes, strawberries, and burley tobacco. Areas of this unit on toe slopes have better air drainage than the other areas of this unit and thus are better suited to frost-sensitive crops, such as tomatoes and strawberries. Irrigation is used to protect high-value crops from frost and to supply supplemental water. Mulch is used in areas where strawberries are grown. It holds moisture, controls weeds, and keeps the berries clean. Grassed field borders and grassed waterways can safely divert runoff. Herbicides may be ineffective because of a high content of organic matter. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat.

This map unit is well suited to woodland. It is desirable for timber production because of high productivity and valuable species. The slope, the hazard of erosion, and runoff from the adjacent higher areas are management concerns. This unit commonly is used for timber production on National Forest lands. Privately owned areas are rarely used for timber production because building site development is an important use. Yellow-poplar is the most common tree. Other trees include black cherry, American beech, sweet birch, northern red oak, sugar maple, and yellow buckeye. Windblown seeds from such species as yellow-poplar, black locust, red maple, eastern hemlock, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production, except where cleared areas are being converted to woodland. Reforestation of hardwoods occurs dominantly through sprouting. In cutover stands cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

White pine can be successfully established in cleared areas. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

Care is needed to prevent soil compaction. The use of heavy equipment should be restricted to dry periods or to periods when the ground is frozen. When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick because of the high content of organic matter and clay.

This map unit is only moderately suited to building site development because of the slope and the restricted permeability. It commonly is used for this purpose because it is commonly near small streams and is crossed by many roads in the county. Runoff from the adjacent higher areas and the hazard of erosion are management concerns. A water table may be at a depth of 6 to 10 feet. Excavation for dwellings with basements is hampered by underground water in some areas. A drainage system is needed in these areas. Building sites should be designed so that runoff is diverted. Water from seeps and springs also should be diverted. Sites that are wet because of seeps, springs, or runoff should not be used for septic tank absorption fields.

This map unit is only moderately suited to specialty crops because of the hazard of erosion. It commonly is used for landscaping plants, apples, Christmas trees, and ginseng. The slope, runoff from the adjacent higher areas, and frost are management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, dogwood, white birch, and rhododendron. Fraser fir is grown for use as Christmas trees. Trees and other plants are easily dug and balled and burlapped. Areas of this unit on toe slopes and benches have better air drainage than the other areas of this unit and thus are better suited to frost-sensitive crops, such as apples. Areas of this unit in coves and on toe slopes have deeper topsoil, more moisture, more organic matter, and lower soil temperature than the other areas of this unit and thus are better suited to Fraser fir. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff. Mulch can be used to help control erosion in cultivated areas where sod cannot be used.

This map unit is only moderately suited to most recreational uses because of the slope. It commonly is used for camp sites and trailer parks because it is commonly near small streams, is shaded in many areas, and is crossed by many roads in the county. Erosion is a hazard. Water sources, such as springs, are common in areas of this unit.

This map unit is only moderately suited to access roads because of the slope and frost action. The U.S. Forest Service generally does not use areas of this map unit for access roads, but some areas are crossed by short sections of roads perpendicular to streams. Privately owned areas are commonly used for this purpose because building site development is an important use. The hazard of erosion, springs and seeps, and runoff from the adjacent higher areas are management concerns. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. Building the roads in upslope areas near the uplands helps to avoid the

springs and the seeps. The roads should be designed so that runoff from the adjacent higher areas is diverted. Water from seeps and springs should be diverted to outlets. The number of culverts needed per mile of road is very high compared to the number needed on soils in the uplands. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality.

The capability subclass is IVe. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8A.

SoD—Soco-Stecoah complex, 15 to 30 percent slopes. This moderately steep map unit consists mainly of a moderately deep, well drained Soco soil and a deep, well drained Stecoah soil. The unit is on mountainsides and narrow ridgetops in the intermediate mountains. Individual areas range from 5 to 50 acres in size. Typically, they are 40 to 50 percent Soco soil and 30 to 40 percent Stecoah soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Soco soil are as follows—

Surface layer:
0 to 5 inches, dark yellowish brown channery fine sandy loam

Subsoil:
5 to 13 inches, strong brown channery loam
13 to 22 inches, strong brown flaggy fine sandy loam

Weathered bedrock:
22 to 35 inches, multicolored metasandstone and phyllite

The typical sequence, depth, and composition of the layers of the Stecoah soil are as follows—

Surface layer:
0 to 6 inches, dark yellowish brown channery fine sandy loam

Subsoil:
6 to 29 inches, strong brown channery fine sandy loam

Underlying material:
29 to 54 inches, mottled strong brown, pale brown, and yellowish brown channery fine sandy loam

Weathered bedrock:
54 to 60 inches, multicolored metasandstone and phyllite

Permeability is moderately rapid in the Soco and Stecoah soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to weathered bedrock is 20 to 40 inches in the Soco soil and 40 to 60 inches in the Stecoah soil. The organic matter content in the surface layer ranges from low to high.

Included in mapping are small areas of Brasstown, Cataska, Cheoah, Junaluska, and Spivey soils. Brasstown and Junaluska soils have more clay in the subsoil than the Soco and Stecoah soils. Cataska soils are shallow over weathered bedrock. Cataska and Spivey soils have more than 35 percent rock fragments in the subsoil. Cheoah and Spivey soils have a darker surface layer than that of the Soco and Stecoah soils. Brasstown and Junaluska soils are on south- to west-facing slopes. Cataska soils are around small areas of rock outcrop. Cheoah soils are on north- to east-facing slopes. Spivey soils are in drainageways. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Soco and Stecoah soils but have a redder subsoil or more stones on the surface.

Much of the acreage in this map unit is used as woodland. Other uses include pasture and building site development.

This map unit is only moderately suited to woodland because of the slope. The hazard of erosion and an equipment limitation are moderate management concerns. Difficult access across steep terrain and soil compaction also are management concerns. This unit produces a lower volume of timber and has fewer valuable species than highly productive soils, such as Cheoah soils. It is logged year-round by the U.S. Forest Service. The most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, pitch pine, Virginia pine, hickory, and northern red oak. Windblown seeds from such species as black locust, red maple, pitch pine, Virginia pine, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good. Hardwood seedlings are preferred on sites where the amount of annual rainfall is more than 60 inches. Reforestation of hardwoods occurs dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. This map unit is droughty. White pine is generally planted where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide

increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

This map unit is only moderately suited to pasture because of the slope. Difficult access across steep terrain and the hazard of erosion also are management concerns. Operating farm equipment is difficult because of the slope. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Keeping the pasture in good condition helps to control erosion.

This map unit is poorly suited to building site development because of the slope and the depth to bedrock. The hazard of erosion and difficult access across steep terrain also are management concerns. Revegetating disturbed areas is difficult because of the slope and freezing and thawing. Hydroseeding is a good way to revegetate steep banks. Excavation for dwellings with basements may be hampered by the depth to bedrock in the Soco soil. In some areas the Soco soil is too shallow to be used as a site for septic tank absorption fields.

This map unit is only moderately suited to hiking trails. The hazard of erosion is a management concern. Freezing and thawing increase the need for trail maintenance on south- to west-facing slopes.

This map unit is not used for row crops or specialty crops. The slope and the hazard of erosion are management concerns.

This map unit is poorly suited to access roads because of the slope. It commonly is used for this purpose, however, because timber production and building site development are important uses. The instability of the underlying bedrock and the hazard of erosion are management concerns. Building the roadbed on natural soil minimizes slumping. The underlying bedrock is susceptible to mass movement, especially during periods of heavy rainfall and high traffic. The orientation of the dip in the rock as it relates to the roadbed greatly affects the likelihood of mass movement occurring. Placing a slight tilt in the roadbed so that water flows off the downhill side is a better way to remove water than ditches, which are impractical because banks slump. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating areas that have been cut and filled is difficult because of the slope and slumping, especially on south- to west-facing slopes that freeze and thaw in spring and fall. Hydroseeding is a good way to revegetate steep roadbanks. Large amounts of ultra acid, sulfur-bearing rock may be exposed by road building. Water seeping through or flowing over this rock may enter nearby streams and kill aquatic life. A plant cover is required to control freezing and thawing of fill material. Lime and fertilizer are required to establish and maintain vegetation.

The capability subclass is VIe. Based on eastern white pine as the indicator species, the woodland ordination symbol is 11R in areas of the Soco soil and 12R in areas of the Stecoah soil.

SoE—Soco-Stecoah complex, 30 to 50 percent slopes. This steep map unit consists mainly of a moderately deep, well drained Soco soil and a deep, well drained Stecoah soil. The unit is on mountainsides and very narrow ridgetops in the low and intermediate mountains. Individual areas range from 5 to 60 acres in size. Typically, they are 40 to 50 percent Soco soil and 30 to 40 percent Stecoah soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Soco soil are as follows—

Surface layer:
- 0 to 5 inches, dark yellowish brown channery fine sandy loam

Subsoil:
- 5 to 13 inches, strong brown channery loam
- 13 to 22 inches, strong brown flaggy fine sandy loam

Weathered bedrock:
- 22 to 35 inches, multicolored metasandstone and phyllite

The typical sequence, depth, and composition of the layers of the Stecoah soil are as follows—

Surface layer:
- 0 to 6 inches, dark yellowish brown channery fine sandy loam

Subsoil:
- 6 to 29 inches, strong brown channery fine sandy loam

Underlying material:
- 29 to 54 inches, mottled strong brown, pale brown, and yellowish brown channery fine sandy loam

Weathered bedrock:
- 54 to 60 inches, multicolored metasandstone and phyllite

Permeability is moderately rapid in the Soco and Stecoah soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and very rapid in areas without forest litter. The depth to weathered bedrock is 20 to 40 inches in the Soco soil and 40 to 60

inches in the Stecoah soil. The organic matter content in the surface layer ranges from low to high.

Included in mapping are small areas of Brasstown, Cataska, Cheoah, Junaluska, and Spivey soils. Brasstown and Junaluska soils have more clay in the subsoil than the Soco and Stecoah soils. Cataska soils are shallow over weathered bedrock. Cataska and Spivey soils have more than 35 percent rock fragments in the subsoil. Cheoah and Spivey soils have a darker surface layer than that of the Soco and Stecoah soils. Brasstown and Junaluska soils are on south- to west-facing slopes. Cataska soils are around small areas of rock outcrop. Cheoah soils are on north- to east-facing slopes. Spivey soils are in drainageways. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Soco and Stecoah soils but have a redder subsoil or more stones on the surface.

Much of the acreage in this map unit is used as woodland. Other uses include pasture, building site development, and recreational activities.

This map unit is poorly suited to woodland because of the slope but is logged year-round by the U.S. Forest Service. The hazard of erosion and an equipment limitation are severe management concerns. These soils produce a lower volume of timber and have fewer valuable species than highly productive soils, such as Cheoah soils. The most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, pitch pine, Virginia pine, hickory, and northern red oak. Windblown seeds from such species as black locust, red maple, pitch pine, Virginia pine, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good. Hardwood seedlings are preferred on sites where the amount of annual rainfall is more than 60 inches. Reforestation of hardwoods occurs dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts.

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. This map unit is droughty. White pine is generally planted where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

This map unit is poorly suited to pasture because of the slope. The hazard of erosion also is a management concern. Operating farm equipment is dangerous because of the slope. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Generally, weeds are controlled and fertilizer and lime are applied by hand. Keeping the pasture in good condition helps to control erosion.

This map unit is poorly suited to building site development because of the slope and the depth to bedrock. The hazard of erosion also is a management concern. Revegetating disturbed areas is difficult because of the slope and freezing and thawing. Hydroseeding is a good way to revegetate steep banks. Excavation for dwellings with basements may be hampered by the depth to bedrock in the Soco soil. Septic tank absorption fields should be dug by hand because of the slope. In some areas the Soco soils is too shallow to be used as a site for septic tank absorption fields.

This map unit is poorly suited to recreational uses because of the slope but is used for overlooks and hiking trails. The hazard of erosion also is a management concern. Freezing and thawing increase the need for trail maintenance on south- to west-facing slopes.

This map unit is not used for crops. The slope is the main management concern. The hazard of erosion also is a management concern.

This map unit is poorly suited to access roads because of the slope. It commonly is used for this purpose, however, because timber production and building site development are important uses. The instability of the underlying bedrock and the hazard of erosion are management concerns. Building the roadbed on natural soil minimizes slumping. The underlying bedrock is susceptible to mass movement, especially during periods of heavy rainfall and high traffic. The orientation of the dip in the rock as it relates to the roadbed greatly affects the likelihood of mass movement occurring. Placing a slight tilt in the roadbed so that water flows off the downhill side is a better way to remove water than ditches, which are impractical because banks slump. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating areas that have been cut and filled is difficult because of the slope and slumping, especially on south- to west-facing slopes that freeze and thaw in spring and fall. Hydroseeding is a good way to revegetate steep roadbanks. Large amounts of ultra acid, sulfur-bearing rock may be exposed by road building. Water seeping through or flowing over this rock may enter nearby streams and kill aquatic life. A plant cover is required to

control freezing and thawing of fill material. Lime and fertilizer are required to establish and maintain vegetation.

The capability subclass is VIIe. Based on eastern white pine as the indicator species, the woodland ordination symbol is 11R in areas of the Soco soil and 12R in areas of the Stecoah soil.

SoF—Soco-Stecoah complex, 50 to 95 percent slopes. This very steep map unit consists mainly of a moderately deep, well drained Soco soil and a deep, well drained Stecoah soil. The unit is on side slopes in the low and intermediate mountains. Individual areas range from 10 to 80 acres in size. Typically, they are 35 to 45 percent Soco soil and 35 to 45 percent Stecoah soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Soco soil are as follows—

Surface layer:

0 to 5 inches, dark yellowish brown channery fine sandy loam

Subsoil:

5 to 13 inches, strong brown channery fine sandy loam

13 to 22 inches, strong brown flaggy fine sandy loam

Weathered bedrock:

22 to 35 inches, multicolored metasandstone and phyllite

The typical sequence, depth, and composition of the layers of the Stecoah soil are as follows—

Surface layer:

0 to 6 inches, dark yellowish brown channery fine sandy loam

Subsoil:

6 to 29 inches, strong brown channery fine sandy loam

Underlying material:

29 to 54 inches, mottled strong brown, pale brown, and yellowish brown channery fine sandy loam

Weathered bedrock:

54 to 60 inches, multicolored metasandstone and phyllite

Permeability is moderately rapid in the Soco and Stecoah soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and very rapid in areas without forest litter. The depth to weathered bedrock is 20 to 40 inches in the Soco soil and 40 to 60 inches in the Stecoah soil. The organic matter content in the surface layer ranges from low to high.

Included in mapping are small areas of Brasstown, Cataska, Cheoah, Junaluska, and Spivey soils. Brasstown and Junaluska soils have more clay in the subsoil than the Soco and Stecoah soils. Cataska soils are shallow over weathered bedrock. Cataska and Spivey soils have more than 35 percent rock fragments in the subsoil. Cheoah and Spivey soils have a darker surface layer than that of the Soco and Stecoah soils. Brasstown and Junaluska soils are on south- to west-facing slopes. Cataska soils are around small areas of rock outcrop. Cheoah soils are on north- to east-facing slopes. Spivey soils are in drainageways. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Soco and Stecoah soils but have a redder subsoil or more stones on the surface.

Nearly all of the acreage in this map unit is used as woodland.

This map unit is poorly suited to woodland because of the slope. The hazard of erosion and an equipment limitation are severe management concerns. The high cost of building and maintaining access roads also is a management concern. This unit produces a lower volume of timber and has fewer valuable species than highly productive soils, such as Cheoah soils. The most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, pitch pine, Virginia pine, hickory, and northern red oak. Windblown seeds from such species as black locust, red maple, pitch pine, Virginia pine, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good. Hardwood seedlings are preferred on sites where the amount of annual rainfall is more than 60 inches. Reforestation of hardwoods occurs dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts (fig. 7).

White pine is grown in areas where the potential for reforestation through sprouting is not good and hardwood seedlings are not available. This map unit is droughty. White pine is generally planted where the amount of annual rainfall is less than 60 inches. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Hardwood competition may need to be controlled again a few years after planting.

The slope restricts the kinds of equipment that can be used. Generally, operating wheeled or tracked

Figure 7.—A clear-cut area of Soco-Stecoah complex, 50 to 95 percent slopes.

equipment is dangerous because of the slope. Cable yarding is safer, disturbs the soil less, and helps to maintain productivity.

This map unit is poorly suited to recreational uses because of the slope but is used for hiking trails. The hazard of erosion also is a management concern. Freezing and thawing increase the need for trail maintenance on south- to west-facing slopes.

This map unit is not used for pasture, building site development, or crops. The slope is the main management concern. The hazard of erosion also is a management concern.

This map unit is poorly suited to access roads because of the slope. It is used for this purpose,

however, because timber production is a use. The instability of the underlying bedrock and the hazard of erosion are management concerns. Building and maintaining roads are difficult and expensive. Building the roadbed on natural soil minimizes slumping. The underlying bedrock is susceptible to mass movement, especially during periods of heavy rainfall and high traffic. The orientation of the dip in the rock as it relates to the roadbed greatly affects the likelihood of mass movement occurring. Placing a slight tilt in the roadbed so that water flows off the downhill side is a better way to remove water than ditches, which are impractical because banks slump. Road construction results in large areas that have been cut and filled. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating areas that have been cut and filled is difficult because of the slope and slumping, especially on south- to west-facing slopes that freeze and thaw in spring and fall. Hydroseeding is a good way to revegetate steep roadbanks. Large amounts of ultra acid, sulfur-bearing rock may be exposed by road building. Water seeping through or flowing over this rock may enter nearby streams and kill aquatic life. A plant cover is required to control freezing and thawing of fill material. Lime and fertilizer are required to establish and maintain vegetation.

The capability subclass is VIIe. Based on eastern white pine as the indicator species, the woodland ordination symbol is 11R in areas of the Soco soil and 12R in areas of the Stecoah soil.

SrC—Spivey-Santeetlah complex, 8 to 15 percent slopes, stony. This strongly sloping map unit consists mainly of very deep, well drained Spivey and Santeetlah soils in coves, in drainageways, and on toe slopes in the low and intermediate mountains. Typically, the Santeetlah soil is between the drainageways, and the Spivey soil is along the drainageways. Scattered stones and boulders are on the surface. Areas in the coves are bowl shaped in the lower part and extend as narrow bands along the drainageways. They are commonly upstream from waterfalls. Areas on the toe slopes and in the drainageways are long and narrow. Individual areas range from 2 to 30 acres in size. Typically, they are 35 to 45 percent Spivey soil and 30 to 40 percent Santeetlah soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Spivey soil are as follows—

Surface layer:
0 to 10 inches, very dark brown very flaggy loam
10 to 18 inches, dark brown very flaggy loam

Subsoil:
18 to 34 inches, dark yellowish brown very flaggy fine sandy loam
34 to 60 inches, dark brown flaggy fine sandy loam

The typical sequence, depth, and composition of the layers of the Santeetlah soil are as follows—

Surface layer:
0 to 6 inches, black loam
6 to 16 inches, very dark grayish brown loam

Subsoil:
16 to 42 inches, dark yellowish brown loam
42 to 60 inches, dark yellowish brown flaggy fine sandy loam

Permeability is moderately rapid in the Spivey and Santeetlah soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and medium in areas without forest litter. Runoff from the adjacent higher areas is concentrated in concave areas. The seasonal high water table is more than 6 feet below the surface. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is high or very high. Stones on the surface interfere with tillage in areas of the Spivey soil. The Santeetlah soil is friable and can be tilled throughout a wide range in moisture content.

Included in mapping are small areas of Dellwood, Nikwasi, and Reddies soils. These soils are on flood plains and are subject to flooding. Dellwood soils are moderately well drained. Nikwasi soils are poorly drained. Also included are springs and seeps, some moderately well drained colluvial soils, and small areas of rubble land where more than 75 percent of the surface is covered by stones and boulders. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Spivey and Santeetlah soils but have a dark surface layer that is less than 10 or more than 20 inches thick or have a seasonal high water table 3 to 6 feet below the surface. Where the surface layer is less than 10 inches thick, the soils are on south- to west-facing slopes. Where the surface layer is more than 20 inches thick, the soils are on north- to east-facing slopes. Where the seasonal high water table is 3 to 6 feet below the surface, the soils are near springs and seeps.

Much of the acreage in this map unit is used as woodland. Other uses include pasture, hayland, specialty crops, row crops, building site development, and recreational activities.

This map unit is well suited to woodland. It is desirable for timber production because of high productivity and valuable species. The slope, the

hazard of erosion, and runoff from the adjacent higher areas are management concerns. This unit commonly is used for timber production on National Forest lands. Privately owned areas are rarely used for timber production because of a high potential for building site development. Yellow-poplar is the most common tree. Other trees include black cherry, American beech, sweet birch, northern red oak, sugar maple, yellow buckeye, eastern hemlock, and Fraser magnolia. Windblown seeds from such species as yellow-poplar, black locust, red maple, eastern hemlock, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good. Hardwood seedlings are preferred on sites where the amount of annual rainfall is more than 60 inches. Reforestation of hardwoods occurs dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts.

White pine can be successfully established in cleared areas. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

Care is needed to prevent soil compaction. The use of heavy equipment should be restricted to dry periods or to periods when the ground is frozen. When the soils are wet, skid trails and unsurfaced roads are highly erodible and very slick because of the organic matter content.

This map unit is only moderately suited to pasture and hay because of stones. The slope, the hazard of erosion, runoff from the adjacent higher areas, and damage to streambanks also are management concerns. Most of the large stones are removed when sod is established. The stones damage farm equipment used for the establishment, maintenance, and harvest of pasture and hayland in areas of the Spivey soil. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Properly locating watering facilities, stream crossings, and fences can help to prevent damage to streambanks and improve water quality. Keeping the pasture in good condition can help to control erosion.

The Santeetlah soil is only moderately suited to specialty crops because of the hazard of erosion. The Spivey soil is poorly suited because of stones. The slope and runoff from the adjacent higher areas also are management concerns. This unit is used for landscaping plants, Christmas trees, and ginseng. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, and rhododendron. Fraser fir and eastern white pine are grown for use as Christmas trees. Most of the large stones are removed when areas of this unit are converted to cropland. Preparing a seedbed and harvesting plants remain difficult in areas of the Spivey soil because of the many small stones. Trees and other plants are easily dug and balled and burlapped in areas of the Santeetlah soil. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff.

The Santeetlah soil is only moderately suited to row crops because of the hazard of erosion. The Spivey soil is poorly suited because of stones. The slope and runoff from the adjacent higher areas also are management concerns. The most common crops are tomatoes and burley tobacco. Most of the large stones are removed when areas of this unit are converted to cropland. Irrigation commonly is used to protect high-value crops from frost and to supply supplemental water. Herbicides may be ineffective because of a high content of organic matter. Because of runoff from the adjacent uplands, erosion can be severe in areas where conventional tillage is used or ground cover is limited. Conservation practices, such as contour rows and diversions, can help to control erosion and runoff. Grassed field borders and grassed waterways can divert water safely around row crops. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat.

The Santeetlah soil is only moderately suited to building site development because of the slope. The Spivey soil is poorly suited because of large stones. Runoff from the adjacent higher areas and the hazard of erosion also are management concerns. A water table may be at a depth of 6 to 10 feet. Excavation for dwellings with basements is hampered by underground water in some areas. A drainage system is needed in these areas. Building sites should be designed so that runoff from the adjacent higher areas is diverted. Water from seeps and springs also should be diverted. Sites that are wet because of seeps, springs, or runoff should not be used for septic tank absorption fields.

The Santeetlah soil is only moderately suited to recreational uses because of the slope. The Spivey soil is poorly suited because of small stones. The hazard of erosion also is a management concern. This unit commonly is used for camp sites and trailer parks because it is near streams and has shaded areas. Water sources, such as springs, are common in areas of this map unit.

The Santeetlah soil is only moderately suited to access roads because of the slope and frost action. The Spivey soil is poorly suited because of large stones.

Runoff from the adjacent higher areas, springs, seeps, and the hazard of erosion also are management concerns. The U.S. Forest Service generally does not use areas of this map unit for access roads, but some areas are crossed by short sections of roads perpendicular to streams. Privately owned areas are commonly used for access roads. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. Building the roads in upslope areas near the uplands helps to avoid the springs, the seeps, and the large stones. The roads should be designed so that runoff from the adjacent higher areas is diverted. Water from seeps and springs should be diverted to outlets. The number of culverts needed per mile of road is very high compared to the number needed on soils in the uplands. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality.

The capability subclass is VIIs in areas of the Spivey soil and IVe in areas of the Santeetlah soil. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8F in areas of the Spivey soil and 8A in areas of the Santeetlah soil.

SrD—Spivey-Santeetlah complex, 15 to 30 percent slopes, stony. This moderately steep map unit consists mainly of very deep, well drained Spivey and Santeetlah soils in coves, in drainageways, and on toe slopes in the low and intermediate mountains. Typically, the Spivey soil is along the drainageways, and the Santeetlah soil is between the drainageways. Scattered stones and boulders are on the surface. Areas in the coves are bowl shaped in the lower part and extend as narrow bands along the drainageways. Areas on the toe slopes and in the drainageways are long and narrow. Individual areas range from 4 to 30 acres in size. Typically, they are 40 to 50 percent Spivey soil and 30 to 40 percent Santeetlah soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Spivey soil are as follows—

Surface layer:

0 to 10 inches, very dark brown very flaggy loam
10 to 18 inches, dark brown very flaggy loam

Subsoil:

18 to 34 inches, dark yellowish brown very flaggy fine sandy loam
34 to 50 inches, dark brown flaggy fine sandy loam

The typical sequence, depth, and composition of the layers of the Santeetlah soil are as follows—

Surface layer:

0 to 6 inches, black loam
6 to 16 inches, very dark grayish brown loam

Subsoil:

16 to 42 inches, dark yellowish brown loam
42 to 60 inches, dark yellowish brown flaggy fine sandy loam

Permeability is moderately rapid in the Spivey and Santeetlah soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and medium or rapid in areas without forest litter. Runoff from the adjacent higher areas is concentrated in concave areas. The seasonal high water table is more than 6 feet below the surface. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is high or very high. Stones on the surface interfere with tillage in areas of the Spivey soil. The Santeetlah soil is friable and can be tilled throughout a wide range in moisture content.

Included in mapping are small areas of Cheoah, Stecoah, and Soco soils. Stecoah and Soco soils have a surface layer that is thinner or lighter in color than that of the Spivey and Santeetlah soils. Also, Soco soils are moderately deep over weathered bedrock. Cheoah, Stecoah, and Soco soils formed in material weathered in place. They are on small knolls. Also included are springs and seeps and small areas of rubble land where more than 75 percent of the surface is covered by stones and boulders. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Spivey and Santeetlah soils but have a dark surface layer that is less than 10 or more than 20 inches thick or have a seasonal high water table 3 to 6 feet below the surface. Where the surface layer is less than 10 inches thick, the soils are on south- to west-facing slopes. Where the surface layer is more than 20 inches thick, the soils are on north- to east-facing slopes.

Much of the acreage in this map unit is used as woodland. Other uses include pasture, specialty crops, building site development, and recreational activities.

This map unit is only moderately suited to woodland because of the slope. The hazard of erosion and an equipment limitation are moderate management concerns. Stones and runoff from the adjacent higher areas also are management concerns. This unit is desirable for timber production, however, because of high productivity and valuable species. It commonly is used for timber production on National Forest lands. Privately owned areas are rarely used for timber production because of a high potential for building site development. Yellow-poplar is the most common tree.

Other trees include black cherry, American beech, sweet birch, northern red oak, sugar maple, yellow buckeye, eastern hemlock, and Fraser magnolia. Windblown seeds from such species as yellow-poplar, black locust, red maple, eastern hemlock, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good. Hardwood seedlings are preferred on sites where the amount of annual rainfall is more than 60 inches. Reforestation of hardwoods occurs dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

Eastern white pine can be successfully established in cleared areas. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

Care is needed to prevent soil compaction. The use of heavy equipment should be restricted to dry periods or to periods when the ground is frozen. When the soils are wet, skid trails and unsurfaced roads are highly erodible and very slick because of the organic matter content.

This map unit is only moderately suited to pasture because of the slope. Stones, the hazard of erosion, runoff from the adjacent higher areas, and damage to streambanks also are management concerns. Operating farm equipment is difficult because of the slope. Most of the large stones are removed when sod is established. The stones damage farm equipment used for the establishment and maintenance of pasture in areas of the Spivey soil. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Properly locating watering facilities, stream crossings, and fences can help to prevent damage to streambanks and improve water quality. Keeping the pasture in good condition can help to control erosion.

The Santeetlah soil is poorly suited to specialty crops because of the hazard of erosion. The Spivey soil is poorly suited because of stones. The slope and runoff from the adjacent higher areas also are management concerns. This unit is used for landscaping plants, Christmas trees, and ginseng. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, and rhododendron. Fraser fir and eastern white pine are grown for use as Christmas trees. Most of the large stones are removed when areas of this unit are converted to cropland. Preparing a seedbed and harvesting plants remain difficult in areas of the Spivey soil because of the many small stones. Trees and other plants are easily dug and balled and burlapped in areas of the Santeetlah soil. Operating farm equipment is difficult because of the slope. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff.

The Santeetlah soil is poorly suited to building site development because of the slope. The Spivey soil is poorly suited because of large stones. Runoff from the adjacent higher areas and the hazard of erosion also are management concerns. A water table may be at a depth of 6 to 10 feet. Excavation for dwellings with basements is hampered by underground water in some areas. A drainage system is needed in these areas. Building sites should be designed so that runoff from the adjacent higher areas is diverted. Water from seeps and springs also should be diverted. Sites that are wet because of seeps, springs, or runoff should not be used for septic tank absorption fields. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality.

The map unit is poorly suited to recreational uses because of the slope and stones. It is used for camp sites and trailer parks, however, because it is near streams and has shaded areas. The hazard of erosion is a management concern. Water sources, such as springs, are common in areas of this map unit.

This map unit is not used for row crops because of the slope.

This map unit is poorly suited to access roads because of the slope and large stones. Runoff from the adjacent higher areas, springs, seeps, and the hazard of erosion also are management concerns. The U.S. Forest Service generally does not use areas of this map unit for access roads, but some areas are crossed by short sections of roads perpendicular to streams. Privately owned areas commonly are used for access roads. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. Building the roads in upslope areas near the uplands helps to avoid the springs, the seeps, and the large stones. The roads should be designed so that runoff from the adjacent higher areas is diverted. Water from seeps and springs should be diverted to outlets. The number of culverts needed per mile of road is very high compared to the number needed on soils in the uplands. Seeding roadbanks and maintaining a good plant cover minimize sedimentation

and improve water quality. Revegetating areas that have been cut and filled is difficult because of the slope. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIIs in areas of the Spivey soil and VIe in areas of the Santeetlah soil. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8R.

SrE—Spivey-Santeetlah complex, 30 to 50 percent slopes, stony. This steep map unit consists mainly of very deep, well drained Spivey and Santeetlah soils in coves, in drainageways, and on toe slopes in the low and intermediate mountains. Typically, the Spivey soil is along the drainageways, and the Santeetlah soil is between drainageways. Scattered stones and boulders are on the surface. Areas in the coves are bowl shaped in the lower part and extend as narrow bands along the drainageways. Areas on the toe slopes and in the drainageways are long and narrow. Individual areas range from 5 to 40 acres in size. Typically, they are 45 to 55 percent Spivey soil and 25 to 35 percent Santeetlah soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Spivey soil are as follows—

Surface layer:

0 to 10 inches, very dark brown very flaggy loam
10 to 18 inches, dark brown very flaggy loam

Subsoil:

18 to 34 inches, dark yellowish brown very flaggy fine sandy loam
34 to 50 inches, dark brown flaggy fine sandy loam

The typical sequence, depth, and composition of the layers of the Santeetlah soil are as follows—

Surface layer:

0 to 6 inches, black loam
6 to 16 inches, very dark grayish brown loam

Subsoil:

16 to 42 inches, dark yellowish brown loam
42 to 60 inches, dark yellowish brown flaggy fine sandy loam

Permeability is moderately rapid in the Spivey and Santeetlah soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and medium or rapid in areas without forest litter. Runoff from the adjacent higher areas is concentrated in concave areas. The seasonal high water table is more than 6 feet below the surface. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is high or very high.

Included in mapping are small areas of Cheoah, Stecoah, and Soco soils. Stecoah and Soco soils have a surface layer that is thinner or lighter in color than that of the Spivey and Santeetlah soils. Also, Soco soils are moderately deep over weathered bedrock. Cheoah, Stecoah, and Soco soils formed in material weathered in place. They are on small knolls. Also included are springs and seeps and small areas of rubble land where more than 75 percent of the surface is covered by stones and boulders. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Spivey and Santeetlah soils but have a dark surface layer that is less than 10 or more than 20 inches thick or have a seasonal high water table 3 to 6 feet below the surface. Where the surface layer is less than 10 inches thick, the soils are on south- to west-facing slopes. Where the surface layer is more than 20 inches thick, the soils are on north- to east-facing slopes. Where the seasonal high water table is 3 to 6 feet below the surface, the soils are near springs and seeps.

Nearly all of the acreage in this map unit is used for woodland.

This map unit is poorly suited to woodland because of the slope. The hazard of erosion and an equipment limitation are severe management concerns. Stones and runoff from the adjacent higher areas also are management concerns. This unit is desirable for timber production, however, because of high productivity and valuable species. Yellow-poplar is the most common tree. Other trees include black cherry, American beech, yellow buckeye, eastern hemlock, and Fraser magnolia at the lower elevations and black cherry, sweet birch, northern red oak, and sugar maple at the higher elevations.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good. Hardwood seedlings are preferred on sites where the amount of annual rainfall is more than 60 inches. Reforestation of hardwoods occurs dominantly through sprouting. In cutover areas cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

Care is needed to prevent soil compaction. Using wheeled and tracked equipment is difficult because of the slope. The use of heavy equipment should be restricted to dry periods or to periods when the ground is frozen. When the soils are wet, skid trails and

unsurfaced roads are highly erodible and very slick because of the organic matter content.

The map unit is poorly suited to recreational uses because of the slope and small stones but is used for hiking trails.

This map unit is not used for pasture, crops, or building site development because of the slope.

This map unit is poorly suited to access roads because of the slope and large stones. Runoff from the adjacent higher areas, springs, seeps, and the hazard of erosion also are management concerns. The U.S. Forest Service generally does not use areas of this map unit for access roads, but some areas are crossed by short sections of roads perpendicular to streams. A few privately owned areas are used for access roads. Building and maintaining the roads are difficult and expensive. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. Building the roads in upslope areas near the uplands helps to avoid the springs, the seeps, and the large stones. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating large areas that have been cut and filled is difficult because of the slope. Hydroseeding is a good way to revegetate steep roadbanks. Building the roadbed on natural soil minimizes slumping. The roads should be designed so that runoff from the adjacent higher areas is diverted. Water from seeps and springs should be diverted to outlets. The number of culverts needed per mile of road is very high compared to the number needed on soils in the uplands.

The capability subclass is VIIs in areas of the Spivey soil and VIIe in areas of the Santeetlah soil. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8R.

StB—Statler fine sandy loam, 1 to 5 percent slopes, rarely flooded. This map unit consists mainly of nearly level and gently sloping, very deep, well drained Statler and similar soils on low stream terraces adjacent to flood plains. Individual areas are long bands and range from 1 to 25 acres in size.

The typical sequence, depth, and composition of the layers of the Statler soil are as follows—

Surface layer:

0 to 10 inches, dark brown fine sandy loam

Subsoil:

10 to 50 inches, strong brown clay loam
50 to 60 inches, strong brown sandy clay loam

Permeability is moderate. Surface runoff is medium. A crust may form on the surface after rainfall. It can cause ponding in concave areas or where outlets have been blocked. The soil is subject to rare flooding. The seasonal high water table is more than 6 feet below the surface. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is moderate or high.

Included in mapping are small areas of Dillard, Hemphill, and Rosman soils. Dillard soils are moderately well drained. Hemphill soils are poorly drained. Rosman soils have less clay in the subsoil than the Statler soil and are frequently flooded. Dillard and Hemphill soils are in depressions. Rosman soils are along main stream channels. Also included are areas of somewhat poorly drained soils. Contrasting inclusions make up about 15 percent of this map unit.

Also included in mapping are some soils that are similar to the Statler soil but have a gravelly surface layer or a seasonal high water 3 to 6 feet below the surface.

Much of the acreage in this map unit is used for row crops. Other uses include specialty crops, pasture, hayland, building site development, recreational activities, and woodland.

This map unit is well suited to row crops. It is desirable because it has good yields, is rarely subject to flooding, and can be planted early. Ponding, the flooding, runoff from the adjacent higher areas, the hazard of erosion, and frost are management concerns. The most common crops are corn for silage, tomatoes, strawberries, and burley tobacco. Properly designed plowing patterns are needed to keep drainage outlets open and to prevent the formation of depressions. Land shaping helps to open outlets and drain surface water from depressions. Grassed field borders and grassed waterways can safely divert runoff. Irrigation is used to protect high-value crops from frost and to supply supplemental water. Mulch is used in areas where strawberries are grown. It holds moisture, controls weeds, and keeps the berries clean. Herbicides may be ineffective because of a high content of organic matter. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat.

This map unit is well suited to specialty crops, such as landscaping plants and Christmas trees. Ponding, the flooding, runoff from the adjacent higher areas, and frost are management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, dogwood, dog hobble, white birch, and rhododendron. Fraser fir is grown for use as Christmas trees. Trees and other plants are easily dug and balled and burlapped. Water management practices

similar to those used for row crops are appropriate.

This map unit is well suited to pasture and hay. Ponding, the flooding, compaction, and damage to streambanks are management concerns. Land shaping helps to open outlets and drain surface water from depressions. Grazing during wet periods causes compaction, increases the hazard of ponding, and reduces the rate of water infiltration. Properly locating watering facilities, stream crossings, and fences can help to prevent damage to streambanks and improve water quality.

This map unit is poorly suited to building site development because of the flooding. Runoff from adjacent areas and ponding are management concerns. A water table may be at a depth of 6 to 10 feet. Excavation for dwellings with basements is hampered by underground water in some areas. A drainage system is needed in these areas. Building sites should be designed so that runoff from the adjacent higher areas is diverted.

This map unit is well suited to woodland. It is not used for timber production, however, because of the small size of the areas and the higher profits from crops, building site development, pasture, and hayland. Yellow-poplar is the most common tree. Other trees include black cherry, American beech, sweet birch, and yellow buckeye. Black walnut grows well on this soil.

This map unit is only moderately suited to recreational uses because of the flooding. It is used for camp sites, parks, picnic areas, and tennis courts.

This map unit is only moderately suited to access roads because of the flooding. It is used for this purpose because crops, building site development, and recreation are important uses. Runoff and ponding are management concerns. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. The roads should be designed so that runoff from the adjacent higher areas is diverted. Roadbeds are elevated. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality.

The capability subclass is IIe. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8A.

SxE—Sylco-Cataska complex, 30 to 50 percent slopes. This steep map unit consists mainly of a moderately deep, well drained Sylco soil and a shallow, excessively drained Cataska soil. The unit is on mountainsides and very narrow ridgetops in the low and intermediate mountains. Individual areas range from 5 to 60 acres in size. Typically, they are 35 to 45 percent Sylco soil and 35 to 45 percent Cataska soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Sylco soil are as follows—

Surface layer:
0 to 6 inches, dark brown very channery loam

Subsoil:
6 to 22 inches, dark yellowish brown very channery loam

Weathered bedrock:
22 to 30 inches, multicolored slate

Hard bedrock:
30 inches, slate

The typical sequence, depth, and composition of the layers of the Cataska soil are as follows—

Surface layer:
0 to 6 inches, dark brown very channery loam

Subsoil:
6 to 16 inches, dark yellowish brown very channery loam

Weathered bedrock:
16 to 30 inches, multicolored slate

Hard bedrock:
30 inches, slate

Permeability is moderately rapid in the Sylco and Cataska soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to weathered bedrock is 20 to 40 inches in the Sylco soil and 10 to 20 inches in the Cataska soil. The organic matter content in the surface layer ranges from low to high in the Sylco soil and from low to moderate in the Cataska soil. Underlying seams of ultra acid, sulfur-bearing rocks are common.

Included in mapping are small areas of Junaluska, Soco, and Spivey soils. Junaluska soils have more clay in the subsoil than the Sylco and Cataska soils, and Spivey soils have a darker surface layer. Junaluska and Soco soils have less than 35 percent rock fragments in the subsoil. They are on foot slopes or in saddles. Spivey soils are in drainageways. Also included are small areas of rock outcrop. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some areas of soils that are similar to the Sylco and Cataska soils but have fewer rock fragments or a redder subsoil.

All of the acreage in this map unit is used as

woodland. Some areas are also used for recreational activities.

This map unit is poorly suited to woodland because of the slope. The hazard of erosion is a moderate management concern. An equipment limitation is a severe management concern. Droughtiness also is a management concern. Productivity is very low. The most common trees are scarlet oak, chestnut oak, black oak, white oak, eastern white pine, shortleaf pine, pitch pine, Virginia pine, and hickory.

This map unit can be used for hardwoods or pines if it is properly managed. Pines are almost always favored over hardwoods because the pines produce a higher profit and are easier to manage. Shortleaf pine is favored over eastern white pine on hot, dry sites. Pines reseed naturally where seed trees are available. Genetically improved species produce a better stand than naturally seeded species. Cutover areas of hardwoods can be prepared for the establishment of pine by prescribed burning and applications of herbicide. This preparation controls plant competition, increases the seedling survival rate, minimizes the amount of debris, and lowers planting costs. Hardwood competition may need to be controlled again a few years after planting.

Hardwoods are preferred for timber production in areas where the annual rainfall is more than 70 inches or wildlife management is the primary land use. Hardwoods grow very slowly. Natural reforestation of hardwoods occurs dominantly through sprouting. Preparing cutover areas for hardwoods by felling the remaining stems increases the number and quality of the sprouts.

This map unit is poorly suited to recreational uses because of the slope but is used for hiking trails. The hazard of erosion also is a management concern.

This map unit is not used for crops, pasture, or building site development. The slope, droughtiness, the depth to bedrock, and the hazard of erosion are management concerns.

This map unit is poorly suited to access roads because of the slope. The depth to bedrock and the instability of the underlying bedrock also are management concerns. Access roads are difficult and expensive to build and maintain. Drilling and blasting of hard bedrock are commonly needed. The underlying bedrock is susceptible to mass movement, especially during periods of heavy rainfall and high traffic. The orientation of the dip in the rock as it relates to the roadbed greatly affects the likelihood of mass movement occurring. Building the roadbed on natural soil minimizes slumping. Placing a slight tilt in the roadbed so that water flows off the downhill side is a better way to manage water than ditches, which are impractical because banks slump. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating disturbed areas is difficult because of the slope and slumping. South- and west-facing slopes that freeze and thaw in spring and fall are difficult to revegetate. Large amounts of ultra acid, sulfur-bearing rock may be exposed by road building. Water seeping through or flowing over this rock may enter nearby streams and kill aquatic life. Preventing damage to the aquatic life in nearby streams requires special treatment of the exposed areas. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIIs. Based on shortleaf pine as the indicator species, the woodland ordination symbol is 5R in areas of the Sylco soil. Based on chestnut oak as the indicator species, the woodland ordination symbol is 2R in areas of the Cataska soil.

SyA—Sylva-Whiteside complex, 0 to 3 percent slopes. This nearly level map unit consists mainly of a very deep, poorly drained Sylva soil and a moderately well drained Whiteside soil. The unit is in coves and drainageways in the intermediate mountains. The Sylva soil is in depressions, and the Whiteside soil is on knolls. Areas in the coves are bowl shaped in the lower part and extend as narrow bands along drainageways. Individual areas range from 2 to 30 acres in size. Typically, they are 40 to 50 percent Sylva soil and 30 to 40 percent Whiteside soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Sylva soil are as follows—

Surface layer:
0 to 4 inches, black loam
4 to 8 inches, very dark grayish brown loam

Subsoil:
8 to 16 inches, grayish brown loam
16 to 22 inches, light brownish gray silty clay loam
22 to 32 inches, light brownish gray sandy loam

Underlying material:
32 to 53 inches, light gray loamy sand
53 to 60 inches, gray loam

The typical sequence, depth, and composition of the layers of the Whiteside soil are as follows—

Surface layer:
0 to 6 inches, very dark grayish brown loam
6 to 11 inches, dark brown loam

Subsoil:

11 to 16 inches, strong brown clay loam that has brownish yellow and gray mottles

16 to 28 inches, brownish yellow loam that has yellowish red and gray mottles

28 to 37 inches, brownish yellow loam that has light brownish gray mottles

Underlying material:

37 to 60 inches, mottled strong brown, brownish yellow, and light brownish gray fine sandy loam

Permeability is moderately rapid in the Sylva soil. Surface runoff is very slow. Runoff from the adjacent higher areas is concentrated and may pond in depressions. The seasonal high water table is at the surface to 1 foot below the surface. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is high or very high.

Permeability is moderate in the Whiteside soil. The seasonal high water table is 1.5 to 3.0 feet below the surface. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is moderate or high.

Included in mapping are small areas of Dellwood, Nikwasi, and Tuckasegee soils. Dellwood and Nikwasi soils are subject to flooding. They are in drainageways. Tuckasegee soils are well drained. They are on small knolls. Also included are springs and seeps and soils that are somewhat poorly drained or that have a very gravelly or very cobbly subsoil. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Sylva and Whiteside soils but have a gravelly surface layer or have a dark surface layer that is less than 7 inches thick.

Much of the acreage in this map unit is used as woodland. Other uses include pasture and recreational activities. Some areas in and around the town of Highlands are used for building site development or golf courses.

The Sylva soil is poorly suited to woodland because of the wetness. The Whiteside soil is well suited. An equipment limitation is a severe management concern in areas of the Sylva soil. This unit is desirable for timber production, however, because of high productivity. It commonly is used for this purpose on National Forest lands. Privately owned areas are rarely used for timber production because of a high potential value for building site development. Eastern white pine and yellow-poplar are the most common trees. Other trees include eastern hemlock, sweet birch, red maple, and basswood. Alder and red maple dominate sites that have been cleared and are reverting to woodland. In cutover stands rhododendron forms a canopy.

Hardwoods are preferred for timber production in areas where the potential for reforestation through sprouting is good and hardwood seedlings are available. White pine is preferred where they have been successfully reestablished. Reforestation of hardwoods is dominantly through sprouting. Cutting all trees and large shrubs increases the number and quality of the sprouts. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs.

Care is needed to prevent soil compaction. The use of heavy equipment should be restricted to dry periods or to periods when the ground is frozen. When the soils are wet, skid trails and unsurfaced roads are very slick because of poor drainage and the organic matter content.

The map unit is poorly suited to building site development because of the wetness and caving of cutbanks. Ponding and runoff from the adjacent higher areas also are management concerns. Excavation for dwellings with basements is impractical because of underground water. Building sites should be designed so that the runoff from the adjacent higher areas is diverted. Water from seeps and springs also should be diverted. Sites that are wet because of seeps, springs, or runoff should not be used for septic tank absorption fields.

The map unit is poorly suited to pasture because of the wetness but is used for this purpose in some drained areas. Drainage, ponding, compaction, and runoff from the adjacent higher areas are management concerns. A tile drainage system is difficult and expensive to install because of the nearly level slope and poor outlets. Grazing during wet periods causes compaction, increases the hazard of ponding, and reduces the rate of water infiltration. Properly locating watering facilities, stream crossings, and fences can help to prevent damage to streambanks and improve water quality.

This map unit is poorly suited to recreational uses because of the wetness. Ponding and runoff from the higher areas also are management concerns.

This map unit is not used for crops. Drainage and ponding are the main management concerns.

This map unit is poorly suited to access roads because of the wetness. Runoff from the adjacent higher areas and ponding also are management concerns. The U.S. Forest Service generally does not use areas of this map unit for access roads, but some areas are crossed by short sections of roads perpendicular to streams. Privately owned areas are commonly filled and used for access roads. Elevating roads during construction provides a suitable roadbed.

Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. The roads should be designed so that runoff is diverted. The number of culverts needed per mile of road is very high compared to the number needed on soils in the uplands.

The capability subclass is IIIw in areas of the Sylva soil and IIw in areas of the Whiteside soil. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8W in areas of the Sylva soil. Based on eastern white pine as the indicator species, the woodland ordination symbol is 12A in areas of the Whiteside soil.

ToA—Toxaway loam, 0 to 2 percent slopes, frequently flooded. This map unit consists mainly of nearly level, very deep, poorly drained and very poorly drained Toxaway and similar soils in depressions on flood plains along large streams. Individual areas are long bands and range from 3 to 40 acres in size.

The typical sequence, depth, and composition of the layers of the Toxaway soil are as follows—

Surface layer:

0 to 14 inches, dark brown loam

14 to 36 inches, black loam

Underlying material:

36 to 42 inches, dark gray loam

42 to 60 inches, light brownish gray silty clay loam

Permeability is moderate. Surface runoff is very slow or ponded. Crusting can increase ponding in areas where outlets have been blocked. The soil is frequently flooded for very brief periods. The seasonal high water table is at the surface to 1 foot below the surface. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer ranges from moderate to very high. The surface layer is friable. Tillage is impractical when the soil is wet.

Included in mapping are small areas of Arkaqua, Dillard, Rosman, and Nikwasi soils. Arkaqua and Dillard soils are somewhat poorly drained. Also, Dillard soils are rarely flooded. Rosman soils are well drained. Nikwasi soils are moderately deep to strata of cobbles, gravels, and sand. Arkaqua and Rosman soils are along stream channels. Dillard soils are on small knolls. Nikwasi soils are in areas scoured by floodwater or in areas where smaller streams cross the unit. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Toxaway soil but have a thinner dark surface layer.

Much of the acreage in this map unit is used as pasture or hayland. Other uses include row crops, woodland, and recreational activities.

If this map unit is drained, it is well suited to pasture and hay. Drainage, ponding, compaction, runoff from the adjacent higher areas, the flooding, and damage to streambanks are management concerns. Tile drainage is limited by the nearly level slope and poor outlets. Land shaping helps to open outlets and drain surface water from depressions. Grazing during wet periods causes compaction, increases the hazard of ponding, and reduces the rate of water infiltration. Properly locating watering facilities, stream crossings, and fences can help to prevent damage to streambanks and improve water quality.

If this map unit is drained, it is moderately suited to row crops. Ponding, the flooding, drainage, crusting, and runoff from the adjacent higher areas are management concerns. Corn for grain or silage is the most common crop. Properly designed plowing patterns are needed to keep drainage outlets open and to prevent the formation of depressions. Grassed field borders and grassed waterways can safely divert runoff. Other water management practices are similar to those used for pasture management. Herbicides may be ineffective because of the organic matter content. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat.

This map unit is poorly suited to woodland because of the wetness and the flooding. An equipment limitation is a severe management concern. This unit generally is not used for timber production because of the small size of the areas, difficulties in management, and the higher profits from other uses. The few areas that are used for timber production are on National Forest lands. Management of these areas is determined by the impact of the management on local streams. Most areas of this unit have been cleared of trees at some time. Alder and red maple dominate sites that are reverting to woodland. Yellow-poplar is the most common tree in wooded areas. Other trees include river birch and American sycamore.

This map unit is poorly suited to recreational uses because of the wetness and the flooding, but some areas are drained and used for camp sites, parks, picnic areas, ball fields, or tennis courts. This unit is desirable for these purposes because of the nearly level terrain and the proximity to streams.

This map unit is not used for residential building site development. The flooding, drainage, and ponding are the main management concerns. The unit is commonly filled, however, and converted to commercial building sites.

This map unit is poorly suited to access roads because of the wetness, the flooding, and low strength. Runoff from the adjacent higher areas and ponding also are management concerns. The U.S. Forest Service

generally does not use areas of this map unit for access roads, but some areas are crossed by short sections of roads perpendicular to streams. A few privately owned areas have been filled and are used for access roads. Elevating roads during construction minimizes the damage caused by the flooding and provides a suitable roadbed. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. The roads should be designed so that runoff is diverted. The number of culverts needed per mile of road is very high compared to the number needed on soils in the uplands.

The capability subclass is IIIw in drained areas and IVw in undrained areas. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 6W.

TrE—Trimont gravelly loam, 30 to 50 percent slopes, stony. This map unit consists mainly of steep, very deep, well drained Trimont and similar soils on mountainsides in the low mountains. The unit is on north- to northeast-facing head slopes and on slopes shaded by higher mountains. Scattered stones and boulders are on the surface. Individual areas range from 5 to 50 acres in size.

The typical sequence, depth, and composition of the layers of the Trimont soil are as follows—

Surface layer:
0 to 9 inches, dark brown gravelly loam

Subsoil:
9 to 23 inches, reddish brown sandy clay loam
23 to 34 inches, yellowish red sandy clay loam
34 to 45 inches, yellowish red fine sandy loam

Underlying material:
45 to 60 inches, multicolored fine sandy loam

Permeability is moderate. Surface runoff is slow in areas where undisturbed forest litter is on the surface and very rapid in areas without forest litter. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is moderate or high. The soil is frozen for long periods in the winter and warms up later in the spring than other soils at the same elevation.

Included in mapping are small areas of Cowee, Evard, and Saunook soils. Cowee and Evard soils have a surface layer that is thinner or lighter in color than that of the Trimont soil. Also, Cowee soils are moderately deep over weathered bedrock. Cowee and Evard soils are on south- to west-facing slopes. Saunook soils formed in colluvial material and are in drainageways. Also included near ridges are small areas of rock outcrop and seeps. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Trimont soil but have a dark surface layer that is more than 10 inches thick or have fewer stones on the surface. Where the surface layer is more than 10 inches thick, the soils are on foot slopes.

Much of the acreage in this map unit is used as woodland. Other uses include building site development, pasture, and specialty crops.

This map unit is poorly suited to woodland because of the slope. The hazard of erosion and an equipment limitation are severe management concerns. This unit is desirable for timber production, however, because of high productivity and valuable species. It commonly is used for this purpose on National Forest lands. Privately owned areas are rarely used for timber production because of a high potential value for building site development. Yellow-poplar is the most common tree. Other trees include black cherry, American beech, sweet birch, white oak, and northern red oak. Scarlet oak, white oak, black oak, and hickory are common on severely high-graded sites. Windblown seeds from such species as yellow-poplar, black locust, red maple, and eastern hemlock reforest old fields.

Hardwoods are preferred for timber production. Reforestation of hardwoods occurs dominantly through sprouting in cutover stands. Cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

Care is needed to prevent soil compaction. Using wheeled and tracked equipment is difficult because of the slope. The use of heavy equipment should be restricted to dry periods or to periods when the ground is frozen. When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick because of the high content of organic matter and clay.

This map unit is poorly suited to building site development because of the slope. The hazard of erosion and severe climatic conditions also are management concerns. Access is often a problem in winter. Revegetating disturbed areas is difficult because of the slope. Hydroseeding is a good way to revegetate steep banks. Septic tank absorption fields should be dug by hand because of the slope.

This map unit is poorly suited to pasture because of the slope but is used for this purpose. The hazard of erosion also is a management concern. Most of the large stones are removed when sod is established. Operating farm equipment is dangerous because of the slope. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Generally, weeds are controlled and

fertilizer and lime are applied by hand. Cool season grasses, such as tall fescue and orchardgrass, can provide late season pasture. Keeping the pasture in good condition helps to control erosion.

This map unit is poorly suited to specialty crops because of the slope but is used for Christmas trees. The hazard of erosion also is a management concern. Fraser fir is grown for use as Christmas trees on foot slopes. Most of the large stones are removed when areas of this unit are converted to production of specialty crops. Operating farm equipment is dangerous because of the slope. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat.

This map unit is not used for row crops. The slope is the main management concern. The hazard of erosion also is a management concern.

This map unit is poorly suited to access roads because of the slope. It commonly is used for this purpose, however, because timber production and building site development are important uses. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. Building the roadbed on natural soil minimizes slumping. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating large areas that have been cut and filled is difficult because of the slope. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIIe. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8R.

TrF—Trimont gravelly loam, 50 to 95 percent slopes, stony. This map unit consists mainly of very steep, very deep, well drained Trimont and similar soils on mountainsides in the low mountains. The unit is on north- to northeast-facing head slopes and on slopes shaded by higher mountains. Scattered stones and boulders are on the surface. Individual areas range from 10 to 80 acres in size.

The typical sequence, depth, and composition of the layers of the Trimont soil are as follows—

Surface layer:
0 to 9 inches, dark brown gravelly loam

Subsoil:
9 to 23 inches, reddish brown sandy clay loam
23 to 34 inches, yellowish red sandy clay loam
34 to 45 inches, yellowish red fine sandy loam

Underlying material:
45 to 60 inches, multicolored fine sandy loam

Permeability is moderate. Surface runoff is slow in areas where undisturbed forest litter is on the surface and very rapid in areas without forest litter. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is moderate or high. The soil is frozen for long periods in the winter and warms up later in the spring than other soils at the same elevation.

Included in mapping are small areas of Cowee, Evard, and Saunook soils. Cowee and Evard soils have a surface layer that is thinner or lighter in color than that of the Trimont soil. Also, Cowee soils are moderately deep over weathered bedrock. Cowee and Evard soils are on south- to west-facing slopes. Saunook soils formed in colluvial material and are in drainageways. Also included near ridges are small areas of rock outcrop and seeps. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Trimont soil but have a dark surface layer that is more than 10 inches thick or have more stones on the surface. Where the surface layer is more than 10 inches thick, the soils are on foot slopes.

Most of the acreage in this map unit is used as woodland. Some areas are used for building site development.

This map unit is poorly suited to woodland because of the slope. The hazard of erosion and an equipment limitation are severe management concerns. This unit is desirable for timber production, however, because of high productivity and valuable species. It commonly is used for this purpose on National Forest lands. Privately owned areas are rarely used for timber production because of a high potential value for building site development. Yellow-poplar is the most common tree. Other trees include black cherry, American beech, sweet birch, white oak, and northern red oak. Scarlet oak, white oak, black oak, and hickory are common on severely high-graded sites. Windblown seeds from such species as yellow-poplar, black locust, red maple, and eastern hemlock reforest old fields.

Hardwoods are preferred for timber production. Reforestation of hardwoods occurs dominantly through sprouting. Cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

When the soil is wet, unsurfaced roads are slick and dangerous because of the high content of organic matter and clay. The slope restricts the kinds of equipment that can be used. Operating wheeled or

tracked equipment is dangerous because of the slope. Cable yarding is safer, disturbs the soil less, and maintains the productivity of the soil.

This map unit is poorly suited to building site development because of the slope. The hazard of erosion and severe climatic conditions also are management concerns. Access is often a problem in winter. Revegetating disturbed areas is difficult because of the slope. Hydroseeding is a good way to revegetate steep banks. Septic tank absorption fields should be dug by hand because of the slope.

This map unit is not used for pasture or crops. The slope is the main management concern. The hazard of erosion and severe climatic conditions also are management concerns.

This map unit is poorly suited to access roads because of the slope. It commonly is used for this purpose, however, because timber production and building site development are important uses. Building and maintaining the roads are difficult and expensive. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. Building the roadbed on natural soil minimizes slumping. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating large areas that have been cut and filled is difficult because of the slope. Hydroseeding is a good way to revegetate steep roadbanks.

The capability subclass is VIIe. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8R.

TsC—Tuckasegee-Cullasaja complex, 8 to 15 percent slopes, stony. This strongly sloping map unit consists mainly of very deep, well drained Tuckasegee and Cullasaja soils in coves, in drainageways, and on toe slopes in the intermediate mountains. Typically, the Tuckasegee soil is between the drainageways, and the Cullasaja soil is along the drainageways. Scattered stones and boulders are on the surface. They are concentrated more heavily on the Cullasaja soil. Areas in the coves are bowl shaped in the lower part and extend as narrow bands along drainageways. Areas on the toe slopes are long and narrow. Individual areas range from 4 to 30 acres in size. Typically, they are 45 to 55 percent Tuckasegee soil and 25 to 35 percent Cullasaja soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Tuckasegee soil are as follows—

Surface layer:

0 to 9 inches, black fine sandy loam
9 to 13 inches, dark brown fine sandy loam

Subsoil:

13 to 26 inches, dark brown fine sandy loam
26 to 47 inches, brown sandy clay loam
47 to 65 inches, strong brown cobbly sandy clay loam

The typical sequence, depth, and composition of the layers of the Cullasaja soil are as follows—

Surface layer:

0 to 10 inches, very dark grayish brown cobbly sandy clay loam
10 to 17 inches, dark brown cobbly fine sandy loam

Subsoil:

17 to 32 inches, strong brown cobbly sandy loam
32 to 65 inches, strong brown cobbly loamy sand

Permeability is moderately rapid in the Tuckasegee and Cullasaja soils. Surface runoff is slow in areas where undisturbed forest litter is on the surface and medium in areas without forest litter. Runoff from the adjacent higher areas is concentrated in concave areas. The seasonal high water table is more than 6 feet below the surface. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is high or very high. Tillage is very difficult in areas of the Cullasaja soil because of the stones on the surface. The areas of the Tuckasegee soil that have very few stones or where stones have been removed from the surface are friable and can be tilled throughout a wide range in moisture content.

Included in mapping are small areas of Dellwood and Whiteside soils. These soils are moderately well drained. Dellwood soils are subject to flooding. Whiteside soils are in depressions. Also included are springs and seeps. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Tuckasegee and Cullasaja soils but have a dark surface layer that is less than 10 or more than 20 inches thick or have a seasonal high water table 3 to 6 feet below the surface. Where the surface layer is less than 10 inches thick, the soils are on south- to west-facing slopes. Where the surface layer is more than 20 inches thick, the soils are on north- to east-facing slopes. Where the seasonal high water table is 3 to 6 feet below the surface, the soils are near springs and seeps.

Much of the acreage in this map unit is used as woodland. Other uses include pasture, hayland, row crops, building site development, recreational activities, and specialty crops.

This map unit is well suited to woodland. It is desirable for timber production because of high productivity and valuable species. The slope, the hazard of erosion, and runoff from the adjacent higher areas are management concerns. This unit commonly is used for timber production on National Forest lands. Privately owned areas are rarely used for timber production because of the higher profits from building site development and row crops. Yellow-poplar is the most common tree. Other trees include black cherry, American beech, sweet birch, northern red oak, sugar maple, yellow buckeye, eastern hemlock, and eastern white pine. Windblown seeds from such species as yellow-poplar, black locust, sugar maple, eastern hemlock, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production, except where cleared areas are being converted to woodland. Reforestation of hardwoods occurs dominantly through sprouting. In cutover stands cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

In cleared areas eastern white pine can be successfully established. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

Care is needed to prevent soil compaction. The use of heavy equipment should be restricted to dry periods or to periods when the ground is frozen. When the soils are wet, skid trails and unsurfaced roads are highly erodible and very slick because of the organic matter content.

This map unit is only moderately suited to pasture and hay because of stones. The slope, the hazard of erosion, runoff from the adjacent higher areas, and damage to streambanks also are management concerns. Most of the large stones are removed when sod is established. The stones damage farm equipment used for the establishment, maintenance, and harvest of pasture and hayland in areas of the Cullasaja soil. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Properly locating watering facilities, stream crossings, and fences can help to prevent damage to streambanks and improve water quality. Keeping the pasture in good condition can help to control erosion.

The Tuckasegee soil is only moderately suited to row crops because of the slope and stones. The Cullasaja soil is not suited because of stones. Runoff from the adjacent higher areas and the hazard of erosion also are management concerns. Cabbage is grown in some areas of the Tuckasegee soil. Most of the large stones are removed when areas of this unit are converted to cropland. Erosion is especially difficult to control in areas where cabbage is grown using conventional tillage because of the limited ground cover provided by the cabbage. Conservation practices, such as contour rows and diversions, can help to control erosion and runoff. Grassed field borders and grassed waterways can divert water safely around row crops. A drainage system is needed in areas around springs and seeps. Herbicides may be ineffective because of a high content of organic matter. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat.

The Tuckasegee soil is only moderately suited to building site development because of the slope. The Cullasaja soil is poorly suited because of large stones and caving of cutbanks. Runoff from the adjacent higher areas and the hazard of erosion also are management concerns. A water table may be at a depth of 6 to 10 feet. Excavation for dwellings with basements is hampered by underground water in some areas. A drainage system is needed in these areas. Building sites should be designed so that runoff from the adjacent higher areas is diverted. Water from seeps and springs also should be diverted. Sites that are wet because of seeps, springs, or runoff should not be used for septic tank absorption fields.

This map unit is only moderately suited to recreational uses, such as camp sites and trailer parks, because of the slope and stones. It is preferred by campers because it is near streams and has shaded areas. The slope and the hazard of erosion are management concerns. Water sources, such as springs, are common in areas of this map unit.

The Tuckasegee soil is only moderately suited to specialty crops, such as ginseng, landscaping plants, and Christmas trees. The Cullasaja soil is poorly suited. Stones, the slope, the hazard of erosion, and runoff from the adjacent higher areas are management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, and rhododendron. Fraser fir and eastern white pine are grown for use as Christmas trees. Most of the large stones are removed when areas of this unit are converted to cropland. Preparing a seedbed and harvesting plants remain difficult in areas of the Cullasaja soil because of the many small stones. Trees and other plants are easily dug and balled and burlapped in areas of the Tuckasegee soil. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff.

The Tuckasegee soil is only moderately suited to access roads because of the slope and frost action. The Cullasaja soil is poorly suited because of large stones. Runoff from the adjacent higher areas, springs, seeps, and the hazard of erosion also are management concerns. The U.S. Forest Service generally does not use areas of this map unit for access roads, but some areas are crossed by short sections of roads perpendicular to streams. Privately owned areas commonly are used for access roads because of the slope. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. Building the roads in upslope areas near the uplands helps to avoid the springs, the seeps, and the large stones. The roads should be designed so that runoff from the adjacent higher areas is diverted. Water from seeps and springs should be diverted to outlets. The number of culverts needed per mile of road is very high compared to the number needed on soils in the uplands. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality.

The capability subclass is IIIe in areas of the Tuckasegee soil and VIIs in areas of the Cullasaja soil. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8A.

TwB—Tuckasegee-Whiteside complex, 2 to 8 percent slopes. This gently sloping map unit consists mainly of a very deep, well drained Tuckasegee soil and a very deep, moderately well drained Whiteside soil. The unit is in coves and drainageways in the intermediate mountains, primarily in the southeastern and southwestern parts of the county. Typically, the Tuckasegee soil is between the drainageways, and the Whiteside soil is along the drainageways. Areas in the coves are bowl shaped in the lower part and extend as narrow bands along drainageways. Individual areas range from 2 to 30 acres in size. Typically, they are 35 to 45 percent Tuckasegee soil and 35 to 45 percent Whiteside soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Tuckasegee soil are as follows—

Surface layer:

0 to 9 inches, black fine sandy loam
9 to 13 inches, dark brown fine sandy loam

Subsoil:

13 to 26 inches, dark brown fine sandy loam
26 to 47 inches, brown sandy clay loam
47 to 65 inches, strong brown cobbly sandy clay loam

The typical sequence, depth, and composition of the layers of the Whiteside soil are as follows—

Surface layer:

0 to 6 inches, very dark grayish brown loam
6 to 11 inches, dark brown loam

Subsoil:

11 to 16 inches, strong brown clay loam that has brownish yellow and gray mottles
16 to 28 inches, brownish yellow loam that has yellowish red and gray mottles
28 to 37 inches, brownish yellow loam that has light brownish gray mottles

Underlying material:

37 to 60 inches, mottled strong brown, brownish yellow, and light brownish gray fine sandy loam

Permeability is moderately rapid in the Tuckasegee soil and moderate in the Whiteside soil. Surface runoff is slow in areas where undisturbed forest litter is on the surface and medium in areas without forest litter. Runoff from the adjacent higher areas is concentrated in concave areas. Water may pond in concave areas where outlets have been blocked. The seasonal high water table is more than 6 feet below the surface in the Tuckasegee soil and at a depth of 1.5 to 3.0 feet in the Whiteside soil. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is high or very high in the Tuckasegee soil and moderate or high in the Whiteside soil. Spring planting may be delayed because of wetness.

Included in mapping are small areas of Dellwood, Nikwasi, and Sylva soils. Dellwood and Nikwasi soils are subject to flooding. Nikwasi and Sylva soils are poorly drained and very poorly drained. They are around springs and seeps. Also included are areas that are somewhat poorly drained. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Tuckasegee and Whiteside soils but have a dark surface layer that is less than 10 or more than 20 inches thick or have a seasonal high water table 3 to 6 feet below the surface. Where the surface layer is less than 10 inches thick, the soils are on small knolls. Where the surface layer is more than 20 inches thick, the soils are in depressions.

Much of the acreage in this map unit is used as woodland. Other uses include row crops, pasture, building site development, recreational activities, and specialty crops.

This map unit is well suited to woodland. It commonly is used for this purpose on National Forest lands.

Privately owned areas are rarely used for timber production because of a high potential value for building site development. This unit is desirable for commercial timber production because of high productivity and valuable species. Runoff from the adjacent higher areas is a management concern. Yellow-poplar is the most common tree. Other trees include black cherry, American beech, sweet birch, northern red oak, sugar maple, yellow buckeye, eastern hemlock, and eastern white pine. Windblown seeds from such species as yellow-poplar, black locust, red maple, eastern hemlock, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production, except where cleared areas are being converted to woodland. Reforestation of hardwoods occurs dominantly through sprouting. In cutover stands cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

White pine can be successfully established in cleared areas. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

Care is needed to prevent soil compaction. The use of heavy equipment should be restricted to dry periods or to periods when the ground is frozen. When the soils are wet, skid trails and unsurfaced roads are erodible and very slick because of the organic matter content.

This map unit is well suited to row crops. Runoff from the adjacent higher areas, the hazard of erosion, ponding, and drainage are management concerns. Cabbage is the main crop. A small acreage is used for broccoli. Properly designed plowing patterns are needed to keep drainage outlets open and to prevent the formation of depressions. Land shaping helps to open outlets and drain surface water from depressions. Erosion is difficult to control in areas where cabbage is grown using conventional tillage because of the high rainfall in the areas and the limited ground cover provided by the cabbage. Conservation practices, such as contour rows and diversions, can help to control erosion and runoff. Grassed field borders and grassed waterways can divert water safely around row crops. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat. A drainage system is needed in areas around springs and seeps. Herbicides may be ineffective because of a high content of organic matter.

This map unit is well suited to pasture. The hazard of erosion, runoff, and damage to streambanks are management concerns. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Land shaping helps to open outlets and drain surface water from depressions. Properly locating watering facilities, stream crossings, and fences can help to prevent damage to streambanks and improve water quality.

The Tuckasegee soil is well suited to building site development. The Whiteside soil is poorly suited because of the wetness and caving of cutbanks. This unit is used for building site development in and around the town of Highlands. Building sites are commonly associated with golf courses. Drainage, runoff from the higher areas, and the hazard of erosion are management concerns. Excavation for dwellings with basements is hampered by underground water in some areas. A drainage system is needed in these areas. Building sites should be designed so that runoff from the adjacent higher areas is diverted. Water from seeps and springs also should be diverted. Sites that are wet because of seeps, springs, or runoff should not be used for septic tank absorption fields. This map unit is in areas where the amount of annual rainfall exceeds 70 inches. Revegetating building sites as soon as possible helps to control erosion in these areas.

The Tuckasegee soil is well suited to recreational uses. The Whiteside soil is only moderately suited because of the wetness. This unit commonly is used for camp sites and hiking trails. Water sources, such as springs, are common in areas of this unit.

This map unit is well suited to specialty crops. It is used for landscaping plants and Christmas trees. The hazard of erosion, runoff, and drainage are management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, and rhododendron. Fraser fir is grown for use as Christmas trees. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff. A drainage system is needed in areas around springs and seeps.

This map unit is only moderately suited to access roads because of frost action and the wetness. The U.S. Forest Service generally does not use areas of this map unit for access roads, but some areas are crossed by short sections of roads perpendicular to streams. Privately owned areas commonly are used for access roads because building site development is an important use. Runoff from the adjacent higher areas, springs, seeps, and the hazard of erosion also are management concerns. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is

needed because ruts form easily. Building the roads in upslope areas near the uplands helps to avoid the springs and the seeps. The roads should be designed so that runoff from the adjacent higher areas is diverted. Water from seeps and springs should be diverted to outlets. The number of culverts needed per mile of road is very high compared to the number needed on soils in the uplands. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality.

The capability subclass is IIe. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8A in areas of the Tuckasegee soil. Based on eastern white pine as the indicator species, the woodland ordination symbol is 12W in areas of the Whiteside soil.

TwC—Tuckasegee-Whiteside complex, 8 to 15 percent slopes. This strongly sloping map unit consists mainly of a very deep, well drained Tuckasegee soil and a very deep, moderately well drained Whiteside soil. The unit is in coves, in drainageways, and on toe slopes in the intermediate mountains. Typically, the Tuckasegee soil is between the drainageways, and the Whiteside soil is along the drainageways. Areas in the coves are bowl shaped in the lower part and extend as narrow bands along drainageways. Areas on the toe slopes are long and narrow. Individual areas range from 4 to 30 acres in size. Typically, they are 45 to 55 percent Tuckasegee soil and 25 to 35 percent Whiteside soil. The two soils occur as areas too intricately mixed and too small to be mapped separately at the selected scale.

The typical sequence, depth, and composition of the layers of the Tuckasegee soil are as follows—

Surface layer:

0 to 9 inches, black fine sandy loam

9 to 13 inches, dark brown fine sandy loam

Subsoil:

13 to 26 inches, dark brown fine sandy loam

26 to 47 inches, brown sandy clay loam

47 to 65 inches, strong brown cobbly sandy clay loam

The typical sequence, depth, and composition of the layers of the Whiteside soil are as follows—

Surface layer:

0 to 6 inches, very dark grayish brown loam

6 to 11 inches, dark brown loam

Subsoil:

11 to 16 inches, strong brown clay loam that has brownish yellow and gray mottles

16 to 28 inches, brownish yellow loam that has yellowish red and gray mottles

28 to 37 inches, brownish yellow loam that has light brownish gray mottles

Underlying material:

37 to 60 inches, mottled strong brown, brownish yellow, and light brownish gray fine sandy loam

Permeability is moderately rapid in the Tuckasegee soil and moderate in the Whiteside soil. Surface runoff is slow in areas where undisturbed forest litter is on the surface and medium in areas without forest litter. Runoff from the adjacent higher areas is concentrated in concave areas. Water may pond in concave areas where outlets have been blocked. The seasonal high water table is more than 6 feet below the surface in the Tuckasegee soil and at a depth of 1.5 to 3.0 feet in the Whiteside soil. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is high or very high in the Tuckasegee soil and moderate or high in the Whiteside soil. Spring planting may be delayed because of wetness.

Included in mapping are small areas of Dellwood, Nikwasi, and Sylva soils. Dellwood and Nikwasi soils are subject to flooding. Nikwasi and Sylva soils are poorly drained and very poorly drained. They are around springs and seeps. Also included are areas that are somewhat poorly drained. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Tuckasegee and Whiteside soils but have a dark surface layer that is less than 10 or more than 20 inches thick or have a seasonal high water table 3 to 6 feet below the surface. Where the surface layer is less than 10 inches thick, the soils are on small knolls. Where the surface layer is more than 20 inches thick, the soils are in depressions. Where the seasonal high water table is 3 to 6 feet below the surface, the soils are near springs and seeps.

Much of the acreage in this map unit is used as woodland. Other uses include row crops, specialty crops, building site development, and pasture.

This map unit is well suited to woodland. It commonly is used for this purpose on National Forest lands. Privately owned areas are rarely used for timber production because of a high potential value for building site development. This unit is desirable for commercial timber production because of high productivity and valuable species. The slope, the hazard of erosion, and runoff from the adjacent higher areas are management concerns. Yellow-poplar is the most common tree. Other trees include black cherry, American beech, sweet birch, northern red oak, sugar maple, yellow buckeye, eastern hemlock, and eastern white pine.

Windblown seeds from such species as yellow-poplar, black locust, red maple, eastern hemlock, and eastern white pine reforest old fields.

Hardwoods are preferred for timber production, except where cleared areas are being converted to woodland. Reforestation of hardwoods occurs dominantly through sprouting. In cutover stands cutting all trees and large shrubs increases the number and quality of the sprouts. When stands are thinned, black cherry, northern red oak, and sugar maple are generally left standing.

White pine can be successfully established in cleared areas. Genetically improved species produce a better stand than naturally seeded eastern white pine. Preparing a site by prescribed burning and applications of herbicide increases the seedling survival rate, controls plant competition, minimizes the amount of debris, and lowers planting costs. Plant competition should be controlled again a few years after planting.

Care is needed to prevent soil compaction. The use of heavy equipment should be restricted to dry periods or to periods when the ground is frozen. When the soils are wet, skid trails and unsurfaced roads are highly erodible and very slick because of the organic matter content.

This map unit is only moderately suited to row crops because of the hazard of erosion. Runoff from the adjacent higher areas, ponding, and drainage also are management concerns. Cabbage is the main crop. A small acreage is used for broccoli. Erosion is difficult to control in areas where cabbage is grown using conventional tillage because of the slope, the high rainfall, and the limited ground cover provided by the cabbage. Conservation practices, such as contour rows and diversions, can help to control erosion and runoff. Grassed field borders and grassed waterways can divert water safely around row crops. Vegetative filter strips slow runoff, improve water quality, and provide wildlife habitat. A drainage system is needed in areas around springs and seeps. Herbicides may be ineffective because of a high content of organic matter.

This map unit is only moderately suited to specialty crops because of the hazard of erosion. It is used for landscaping plants and Christmas trees. The slope and runoff from the adjacent higher areas are management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, and rhododendron. Fraser fir is grown for use as Christmas trees. Trees and other plants are easily dug and balled and burlapped in areas of the Tuckasegee soil. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff. A drainage system is needed in areas around springs and seeps.

The Tuckasegee soil is only moderately suited to building site development because of the slope. The Whiteside soil is poorly suited because of the wetness and caving of cutbanks. This unit is used for building site development in and around the town of Highlands. Building sites are commonly associated with golf courses. Drainage, runoff from the higher areas, and the hazard of erosion are management concerns. Excavation for dwellings with basements is hampered by underground water in some areas. A drainage system is needed in these areas. Building sites should be designed so that runoff from the adjacent higher areas is diverted. Water from seeps and springs also should be diverted. Sites that are wet because of seeps, springs, or runoff should not be used for septic tank absorption fields. This map unit is in areas where the amount of annual rainfall exceeds 70 inches. Revegetating building sites as soon as possible helps to control erosion in these areas.

This map unit is well suited to pasture. The slope, the hazard of erosion, runoff from the adjacent higher areas, and damage to streambanks are management concerns. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Properly locating watering facilities, stream crossings, and fences can help to prevent damage to streambanks and improve water quality.

The map unit is only moderately suited to recreational uses because of the slope and the wetness. This unit commonly is used for camp sites and hiking trails. Water sources, such as springs, are common in areas of this unit.

This map unit is only moderately suited to access roads because of the slope, frost action, and the wetness. Runoff from the adjacent higher areas, springs, seeps, and the hazard of erosion also are management concerns. The U.S. Forest Service generally does not use areas of this map unit for access roads, but some areas are crossed by short sections of roads perpendicular to streams. Privately owned areas commonly are used for access roads because building site development is an important use. Because unsurfaced roads are soft and slick when wet, surfacing is required for year-round use. Gravel continuously sinks into the soil material. Frequent smoothing of the road surface is needed because ruts form easily. Building the roads in upslope areas near the uplands helps to avoid the springs and the seeps. The roads should be designed so that runoff from the adjacent higher areas is diverted. Water from seeps and springs should be diverted to outlets. The number of culverts needed per mile of road is very high compared to the number needed on soils in the uplands. Seeding

roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality.

The capability subclass is IIIe. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 8A in areas of the Tuckasegee soil. Based on eastern white pine as the indicator species, the woodland ordination symbol is 12A in areas of the Whiteside soil.

Ud—Udorthents, loamy. This map unit consists of borrow areas, landfills, and mines and major revegetated cut and fill areas associated with major highways, commercial sites, and golf courses. Slopes range from nearly level to very steep.

Borrow areas consist of excavated areas from which the original soil material has been removed for use as fill material in construction. The cuts are 4 to more than 20 feet deep. The base slope in these cuts is level to steep. Most cuts have 2 or more nearly vertical side slopes. The exposed surface layer consists mainly of dense, weathered bedrock. Borrow areas commonly range from 3 to 10 acres in size. Commonly included in the borrow areas are small areas of intermittent ponded water, loose fill material, and exposed bedrock.

Some borrow areas are temporarily seeded and vegetated. Other borrow areas are naturally reseeded by native grasses, weeds, and trees. Borrow areas have poor physical properties for plant growth. The available water capacity, soil fertility, and organic matter content are low. Rooting depth commonly is shallow. Areas that are seeded have potential for use as wildlife habitat. Neglected areas are easily eroded and are a significant source of sediment in streams.

Landfills are excavated areas where graded trenches have been backfilled with alternate layers of solid refuse and soil material. After a final cover of about 2 feet of soil is added, the areas range from nearly level to steep. Maintaining a plant cover is difficult and expensive in most areas of landfill. The potential for the production of methane gas severely limits the use of these areas after landfill operations are completed.

Mines consist of areas that are actively being mined or have recently been mined. Gneiss is mined and crushed for use in roadbeds and as construction material. Olivine has been mined in areas along Ellijay Creek.

Onsite investigation is needed before the use and management of specific areas are planned.

Cut and fill areas associated with major highways are areas where a large amount of soil material has been moved for the construction of roads. These long areas are along U.S. Highways 64 and 441. They have been seeded and vegetated. Many of the cuts are 10 to more than 40 feet deep. The areas of fill are 10 to more than 30 feet deep. Drilling and blasting hard bedrock have left exposed, nearly vertical rock faces in some areas. The slope ranges from gently sloping to nearly vertical. Individual areas commonly are 400 to 1,000 feet wide and range from 10 to more than 500 acres in size.

Cut and fill areas associated with commercial sites are excavated areas that have been leveled for commercial sites along major highways. These areas mostly are along U.S. highways 64 and 441 or near the town of Franklin. They have been seeded and vegetated. Many of the cuts are 10 to more than 40 feet deep. The areas of fill are commonly 10 or more feet deep. The slope generally is nearly level but in some small areas is nearly vertical. Individual areas commonly range from 3 to 20 acres in size.

Cut and fill areas associated with golf courses are major excavated areas that have been leveled for golf courses. These areas are largely in and around the towns of Franklin and Highlands. They are seeded and vegetated. Many of the cuts are 10 to more than 20 feet deep. The areas of fill are commonly 10 or more feet deep. The slope generally ranges from gently sloping to moderately steep but in some small areas is nearly vertical. Individual areas commonly range from 10 to 50 or more acres in size.

The capability subclass is VIIe. This unit has not been assigned a woodland ordination symbol.

UfB—Udorthents-Urban land complex, 0 to 5 percent slopes, rarely flooded. This nearly level and gently sloping map unit occurs mainly as areas of Udorthents and areas of Urban land. It is on filled and graded flood plains. Individual areas are long and narrow, parallel stream channels, and generally range from 2 to 50 acres in size. Typically, they are 45 to 55 percent loamy fill material and 25 to 35 percent Urban land. The Udorthents and Urban land occur as areas too intricately mixed to be mapped separately at the selected scale.

Udorthents consist of areas of predominantly loamy fill material. These areas are 2 feet to more than 10 feet thick. The areas on flood plains were filled to reduce the hazard of flooding. Areas of Udorthents revegetate quickly after construction. The characteristics of the soil material are highly variable.

The Urban land consists of impervious areas that are covered with buildings, roads, and parking lots.

Included in mapping are small areas of steep banks and loamy material that contains stones, asphalt, and stumps. These inclusions make up about 10 percent of this map unit.

Onsite investigation is needed before the use and management of specific areas are planned.

Foundation problems are common in areas of this unit. Engineering tests are needed to determine the suitability of specific sites for foundations.

This map unit is subject to rare flooding. Surface runoff from the impervious areas during intense rainfall increases the hazard of flooding in downstream areas. The areas of earthy fill material are generally vegetated and used for lawns, ball fields, or open areas.

The capability subclass is VIIs in areas of the Udorthents and VIIIs in areas of the Urban land. This map unit has not been assigned a woodland ordination symbol.

WeC—Wayah sandy loam, windswept, 8 to 15 percent slopes, stony. This map unit consists mainly of strongly sloping, very deep, well drained Wayah and similar soils on moderately broad ridgetops in the high mountains. Scattered stones and boulders are on the surface. Individual areas are irregular in shape and range from 4 to 30 acres in size.

The typical sequence, depth, and composition of the layers of the Wayah soil are as follows—

Surface layer:

0 to 8 inches, very dark brown sandy loam

8 to 13 inches, very dark grayish brown fine sandy loam

13 to 15 inches, dark brown fine sandy loam

Subsoil:

15 to 27 inches, light olive brown sandy loam

27 to 37 inches, yellowish brown sandy loam

Underlying material:

37 to 60 inches, multicolored loamy sand

Permeability is moderately rapid. Surface runoff is slow in areas where undisturbed forest litter is on the surface and medium in areas without forest litter. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is very high. Stones on the surface are a management concern. The climate is severe. Winter is cold, icy, and windy. The rest of the year is rainy, foggy, and cool. The soil is frozen for long periods in the winter.

Included in mapping are small areas of Burton and Craggey soils. Burton soils are moderately deep over hard bedrock. Craggey soils are shallow over hard bedrock. Burton and Craggey soils are near small areas of rock outcrop and on south- to west-facing spur ridges. Also included are small areas of rock outcrop and seeps. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Wayah soil but have a dark surface layer that is less than 10 or more than 20 inches thick or have fewer stones on the surface. Where the surface layer is less than 10 inches thick, the soils are on nose slopes or shoulder slopes. Where the surface layer is more than 20 inches thick, the soils are in saddles.

Most of the acreage in this map unit is wooded. A few balds are covered with rhododendron and blueberry. Some areas are used for recreational activities, building site development, pasture, or specialty crops.

This map unit is poorly suited to woodland because of the severe climatic conditions, which cause low productivity. It is not capable of producing commercial timber. Trees are stunted, twisted, or otherwise damaged by wind and ice. Northern red oak is the most common tree. Other trees include a few sugar maple, sweet birch, and yellow birch.

This map unit is only moderately suited to most recreational uses because of the slope. It has scenic views and is used for camp sites, overlooks, and hiking trails. Stones and the hazard of erosion are management concerns. Freezing and thawing increase the need for trail maintenance. Water sources, such as springs, are not generally available in areas of this unit.

This map unit is only moderately suited to building sites because of the slope and caving of cutbanks. Stones, difficult access across steep terrain, and the hazard of erosion also are management concerns. Because of cold winter temperatures and high winds, building sites are used mainly for summer homes. Because of the depth to which the soil freezes, deeper than normal septic tank absorption field lines are needed. This map unit is in areas where the amount of annual rainfall exceeds 70 inches. Revegetating building sites as soon as possible helps to control erosion in these areas.

This map unit is well suited to summer pasture. Stones, difficult access across steep terrain, and the hazard of erosion are management concerns. Most of the large stones are removed when sod is established. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Cool season grasses, such as tall fescue and orchardgrass, can provide late season pasture. Keeping the pasture in good condition helps to control erosion.

This map unit is only moderately suited to specialty crops because of the hazard of erosion. It is used for landscaping plants and Christmas trees. Stones, difficult access across steep terrain, and the slope are management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, and rhododendron. Fraser fir is grown for use as Christmas trees. Most of the large stones are removed when areas of this unit are converted to production of specialty crops. Establishing and maintaining sod in

areas that are not used for crops minimize erosion and help to control runoff. Mulch can be used to help control erosion in cultivated areas where sod cannot be used.

This map unit is not used for crops because of difficult access across steep terrain and the cold climate. The slope, stones, and the hazard of erosion also are management concerns.

This map unit is only moderately suited to access roads because of the slope and frost action. In privately owned areas, the roads access building sites. On National Forest lands, the roads access fire towers; wildlife fields; or television, radio, and telephone receiving and transmitting stations. Building and maintaining the roads are difficult and expensive. Damage to road surfaces is severe because of the climate. Building the roadbed on natural soil minimizes slumping. Because unsurfaced roads are slick when wet, surfacing is required for year-round use. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating areas that have been cut and filled is difficult, mostly because of freezing and thawing in spring and fall.

The capability subclass is IVe. Based on northern red oak as the indicator species, the woodland ordination symbol is 2A.

WeD—Wayah sandy loam, windswept, 15 to 30 percent slopes, stony. This map unit consists mainly of moderately steep, very deep, well drained Wayah and similar soils on moderately broad ridgetops in the high mountains. Scattered stones and boulders are on the surface. Individual areas are irregular in shape and range from 5 to 40 acres in size.

The typical sequence, depth, and composition of the layers of the Wayah soil are as follows—

Surface layer:

0 to 8 inches, very dark brown sandy loam

8 to 13 inches, very dark grayish brown fine sandy loam

13 to 15 inches, dark brown fine sandy loam

Subsoil:

15 to 27 inches, light olive brown sandy loam

27 to 37 inches, yellowish brown sandy loam

Underlying material:

37 to 60 inches, multicolored loamy sand

Permeability is moderately rapid. Surface runoff is slow in areas where undisturbed forest litter is on the surface and rapid in areas without forest litter. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is very high. Stones on the surface are a management concern. The climate is severe. Winter is cold, icy, and windy. The rest of the year is rainy, foggy, and cool. The soil is frozen for long periods in the winter.

Included in mapping are small areas of Burton and Craggey soils. Burton soils are moderately deep over hard bedrock. Craggey soils are shallow over hard bedrock. Burton and Craggey soils are near small areas of rock outcrop and are on south- to west-facing spur ridges. Also included are small areas of rock outcrop and seeps. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Wayah soil but have a dark surface layer that is less than 10 or more than 20 inches thick or have fewer stones on the surface. Where the surface layer is less than 10 inches thick, the soils are on nose slopes or shoulder slopes. Where the surface layer is more than 20 inches thick, the soils are in saddles.

Most of the acreage in this map unit is wooded. A few balds are covered with rhododendron and blueberry. Some areas are used for recreational activities, pasture, specialty crops, or building site development.

This map unit is poorly suited to woodland because of the severe climatic conditions, which cause low productivity. Stones, the hazard of erosion, and the slope also are management concerns. This unit does not produce commercial timber. Trees are stunted, twisted, or otherwise damaged by wind and ice. Northern red oak is the most common tree. Other trees include a few sugar maple, sweet birch, and yellow birch.

This map unit is only moderately suited to most recreational uses because of the slope. It has scenic views and is used for overlooks and hiking trails. Stones and the hazard of erosion are management concerns. Freezing and thawing increase the need for trail maintenance.

This map unit is only moderately suited to summer pasture because of the slope. Stones, difficult access across steep terrain, and the hazard of erosion also are management concerns. Most of the large stones are removed when sod is established. Operating farm equipment is difficult because of the slope. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Cool season grasses, such as tall fescue and orchardgrass, can provide late season pasture. Keeping the pasture in good condition helps to control erosion.

This map unit is poorly suited to specialty crops because of the hazard of erosion but is used for landscaping plants and Christmas trees. Stones, difficult access across steep terrain, and the slope also are management concerns. The most common landscaping

plants are eastern hemlock, Norway spruce, mountain laurel, and rhododendron. Fraser fir is grown for use as Christmas trees. Most of the large stones are removed when areas of this unit are converted to production of specialty crops. Operating farm equipment is difficult because of the slope. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff. Mulch can be used to help control erosion in cultivated areas where sod cannot be used.

This map unit is poorly suited to building sites because of the slope and caving of cutbanks. Stones, difficult access across steep terrain, and the hazard of erosion also are management concerns. Because of cold winter temperatures and high winds, building sites are used mainly for summer homes. Because of the depth to which the soil freezes, deeper than normal septic tank absorption field lines are needed. Revegetating disturbed areas is difficult because of the slope and freezing and thawing in spring and fall. Hydroseeding is a good way to revegetate steep banks. This map unit is in areas where the amount of annual rainfall exceeds 70 inches. Revegetating building sites as soon as possible helps to control erosion in these areas.

This map unit is not used for crops. The slope, difficult access across steep terrain, the cold climate, stones, and the hazard of erosion are management concerns.

This map unit is poorly suited to access roads because of the slope. In privately owned areas, the roads access building sites. On National Forest lands, the roads access fire towers; wildlife fields; or television, radio, and telephone receiving and transmitting stations. Building and maintaining the roads are difficult and expensive. Damage to road surfaces is severe because of the climate. Building the roadbed on natural soil minimizes slumping. Because unsurfaced roads are slick when wet, surfacing is required for year-round use. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating areas that have been cut and filled is difficult because of the slope and freezing and thawing in spring and fall. Hydroseeding is a good way to revegetate steep banks.

The capability subclass is VIe. Based on northern red oak as the indicator species, the woodland ordination symbol is 2R.

WeE—Wayah sandy loam, windswept, 30 to 50 percent slopes, stony. This map unit consists mainly of steep, very deep, well drained Wayah and similar soils on mountainsides and ridgetops in the high mountains. Scattered stones and boulders are on the surface. Individual areas on ridges are irregular in shape and range from 5 to 80 acres in size.

The typical sequence, depth, and composition of the layers of the Wayah soil are as follows—

Surface layer:
- 0 to 8 inches, very dark brown sandy loam
- 8 to 13 inches, very dark grayish brown fine sandy loam
- 13 to 15 inches, dark brown fine sandy loam

Subsoil:
- 15 to 27 inches, light olive brown sandy loam
- 27 to 37 inches, yellowish brown sandy loam

Underlying material:
- 37 to 60 inches, multicolored loamy sand

Permeability is moderately rapid. Surface runoff is slow in areas where undisturbed forest litter is on the surface and very rapid in areas without forest litter. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is very high. Stones on the surface are a management concern. The climate is severe. Winter is cold, icy, and windy. The rest of the year is rainy, foggy, and cool. The soil is frozen for long periods in the winter.

Included in mapping are small areas of Burton, Craggey, and Cullasaja soils. Burton soils are moderately deep over hard bedrock. Craggey soils are shallow over hard bedrock. Cullasaja soils have more than 35 percent rock fragments in the subsoil. Burton and Craggey soils are near small areas of rock outcrop and are on south- to west-facing spur ridges. Cullasaja soils are in drainageways. Also included are small areas of rock outcrop and seeps. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Wayah soil but have a dark surface layer that is less than 10 or more than 20 inches thick or have fewer stones on the surface. Where the surface layer is less than 10 inches thick, the soils are on nose slopes or shoulder slopes. Where the surface layer is more than 20 inches thick, the soils are in saddles or on foot slopes.

Most of the acreage in this map unit is wooded. A few balds are covered with rhododendron and blueberry. Some areas are used for recreational activities, pasture, specialty crops, or building site development.

This map unit is poorly suited to woodland because of the slope and severe climatic conditions, which cause low productivity. It does not produce commercial timber because the trees are stunted, twisted, or otherwise damaged by wind and ice. Stones and the hazard of erosion also are management concerns.

Northern red oak is the most common tree. Other trees include a few sweet birch and yellow birch.

This map unit is poorly suited to recreational uses because of the slope but has scenic views and is used for overlooks and hiking trails. Stones and the hazard of erosion also are management concerns. Freezing and thawing increase the need for trail maintenance.

This map unit is poorly suited to summer pasture because of the slope. Stones and the hazard of erosion also are management concerns. Most of the large stones are removed when sod is established. Operating farm equipment is dangerous because of the slope. Erosion is a hazard in areas where plants are becoming established and in sparsely vegetated or overgrazed areas. Generally, weeds are controlled and fertilizer and lime are applied by hand. Cool season grasses, such as tall fescue and orchardgrass, can provide late season pasture. Keeping the pasture in good condition helps to control erosion.

This map unit is poorly suited to specialty crops because of the hazard of erosion but is used for landscaping plants and Christmas trees. Stones, difficult access across steep terrain, and the slope also are management concerns. The most common landscaping plants are eastern hemlock, Norway spruce, mountain laurel, and rhododendron. Fraser fir is grown for use as Christmas trees. Most of the large stones are removed when areas of this unit are converted to production of specialty crops. Operating farm equipment is dangerous because of the slope. Establishing and maintaining sod in areas that are not used for crops minimize erosion and help to control runoff. Mulch can be used to help control erosion in cultivated areas where sod cannot be used.

This map unit is poorly suited to building sites because of the slope and caving of cutbanks. Stones and the hazard of erosion also are management concerns. Because of cold winter temperatures and high winds, building sites are used mainly for summer homes. Septic tank absorption fields should be dug by hand because of the slope. Because of the depth to which the soil freezes, deeper than normal septic tank absorption field lines are needed. Revegetating disturbed areas is difficult because of the slope and freezing and thawing in spring and fall. Hydroseeding is a good way to revegetate steep banks. This map unit is in areas where the amount of annual rainfall exceeds 70 inches. Revegetating building sites as soon as possible helps to control erosion in these areas.

This map unit is not used for row crops. The slope is the main management concern. The cold climate, stones, and the hazard of erosion also are management concerns.

This map unit is poorly suited to access roads because of the slope. In privately owned areas, the roads access building sites. On National Forest lands, the roads access fire towers; wildlife fields; or television, radio, and telephone receiving and transmitting stations. Building and maintaining the roads are difficult and expensive. Damage to road surfaces is severe because of the climate. Building the roadbed on natural soil minimizes slumping. Because unsurfaced roads are slick when wet, surfacing is required for year-round use. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating areas that have been cut and filled is difficult because of the slope and freezing and thawing in spring and fall. Hydroseeding is a good way to revegetate steep banks.

The capability subclass is VIIe. Based on northern red oak as the indicator species, the woodland ordination symbol is 2R.

WeF—Wayah sandy loam, windswept, 50 to 95 percent slopes, stony. This map unit consists mainly of very steep, very deep, well drained Wayah and similar soils on mountainsides in the high mountains. Scattered stones and boulders are on the surface. Individual areas range from 10 to 80 acres in size.

The typical sequence, depth, and composition of the layers of the Wayah soil are as follows—

Surface layer:
0 to 8 inches, very dark brown sandy loam
8 to 13 inches, very dark grayish brown fine sandy loam
13 to 15 inches, dark brown fine sandy loam

Subsoil:
15 to 27 inches, light olive brown sandy loam
27 to 37 inches, yellowish brown sandy loam

Underlying material:
37 to 60 inches, multicolored loamy sand

Permeability is moderately rapid. Surface runoff is slow in areas where undisturbed forest litter is on the surface and very rapid in areas without forest litter. The depth to bedrock is more than 60 inches. The organic matter content in the surface layer is very high. The climate is severe. Winter is cold, icy, and windy. The rest of the year is rainy, foggy, and cool. The soil is frozen for long periods in the winter.

Included in mapping are small areas of Burton, Craggey, and Cullasaja soils. Burton soils are moderately deep over hard bedrock. Craggey soils are shallow over hard bedrock. Cullasaja soils have more than 35 percent rock fragments in the subsoil. Burton and Craggey soils are near small areas of rock outcrop and on south- to west-facing spur ridges. Cullasaja soils

are in drainageways. Also included are small areas of rock outcrop and seeps. Contrasting inclusions make up about 20 percent of this map unit.

Also included in mapping are some soils that are similar to the Wayah soil but have a dark surface layer that is less than 10 or more than 20 inches thick or have fewer stones on the surface. Where the surface layer is less than 10 inches thick, the soils are on nose slopes or shoulder slopes. Where the surface layer is more than 20 inches thick, the soils are on toe slopes.

Nearly all of the acreage in this map unit is wooded. A few balds are covered with rhododendron and blueberry.

This map unit is poorly suited to woodland because of the slope and severe climatic conditions, which cause low productivity. It does not produce commercial timber because the trees are stunted, twisted, or otherwise damaged by wind and ice. Stones and the hazard of erosion also are management concerns. Northern red oak is the most common tree. Other trees include a few sweet birch and yellow birch.

This map unit is poorly suited to recreational uses because of the slope but is used for hiking trails. These trails are part of the Appalachian Trail system or access scenic overlooks. Stones and the hazard of erosion are management concerns. Freezing and thawing increase the need for trail maintenance.

This map unit is not used for row crops, pasture, or building site development. The slope and climate are the main management concerns. Stones and the hazard of erosion also are management concerns.

This map unit is poorly suited to access roads because of the slope. In privately owned areas, the roads access building sites. On National Forest lands, the roads access fire towers; wildlife fields; or television, radio, and telephone receiving and transmitting stations. Building and maintaining the roads are difficult and expensive. Damage to road surfaces is severe because of the climate. Building the roadbed on natural soil minimizes slumping. Because unsurfaced roads are slick when wet, surfacing is required for year-round use. Seeding roadbanks and maintaining a good plant cover minimize sedimentation and improve water quality. Revegetating areas that have been cut and filled is difficult because of the slope and freezing and thawing in spring and fall. Hydroseeding is a good way to revegetate steep banks.

The capability subclass is VIIe. Based on northern red oak as the indicator species, the woodland ordination symbol is 2R.

Prime Farmland

In this section, prime farmland is defined and the soils in Macon County that are considered prime farmland are listed.

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, State, and Federal levels, as well as individuals, must encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to food, feed, forage, fiber, and oilseed crops. Such soils have properties that favor the economic production of sustained high yields of crops. The soils need only to be treated and managed by acceptable farming methods. The moisture supply must be adequate, and the growing season must be sufficiently long. Prime farmland soils produce the highest yields with minimal expenditure of energy and economic resources. Farming these soils results in the least damage to the environment.

Prime farmland soils may presently be used as cropland, pasture, or woodland or for other purposes. They are used for food or fiber or are available for these uses. Urban or built-up land, public land, and water areas cannot be considered prime farmland. Urban or built-up land is any contiguous unit of land 10 acres or more in size that is used for such purposes as housing, industrial, and commercial sites, sites for institutions or public buildings, small parks, golf courses, cemeteries, railroad yards, airports, sanitary landfills, sewage treatment plants, and water-control structures. Public land is land not available for farming in National forests, National parks, military reservations, and State parks.

Prime farmland soils usually receive an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The acidity or alkalinity level of the soils is acceptable. The soils have few or no rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not frequently flooded during the growing season. The slope ranges mainly from 0 to 8 percent.

The map units listed in table 5 are considered prime farmland in Macon County. The location of each map unit is shown on the detailed soil maps at the back of this publication. The extent of each unit is given in table 4. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units." This list does not constitute a recommendation for a particular land use.

Some soils that have a high water table and all soils that are frequently flooded during the growing season qualify as prime farmland only in areas where these limitations have been overcome by drainage measures or flood control. If applicable, the need for these measures is indicated in parentheses after the map unit name in table 5. Onsite evaluation is necessary to determine whether or not limitations have been overcome by corrective measures.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Generally, the soils in Macon County that are well suited to crops are also well suited to urban uses. The data concerning specific soils in the county can be used in planning future land use patterns. The potential for farming should be considered relative to any soil limitations and the potential for nonfarm development.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern that is in harmony with nature.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

William Yarborough, fertility specialist, Soil Testing Service, North Carolina Department of Agriculture; Steve West, county extension director, Haywood County, North Carolina; Bobby G. Brock, agronomist, Natural Resources Conservation Service; and James L. Wiggins, district conservationist, Natural Resources Conservation Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants commonly grown on the soils are identified; the system of land capability classification used by the Natural Resources Conservation Service is explained; and the estimated yields of the major crops and hay and pasture plants are listed for the soils.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units" and in the tables. Specific information can be obtained from the local office of the Natural Resources Conservation Service or the North Carolina Cooperative Extension Service.

Cropland

Most of the cultivated areas in Macon County are on flood plains or low rolling hills. Small cultivated areas are in the intermediate mountains around the Scaly Mountain community and in scattered areas in coves on the low and intermediate mountains. Cropland needs to be managed to conserve soil and water and to maintain and improve tilth and fertility.

Conventional crops and ornamental and horticultural crops are grown in the county. The most common conventional crops are corn for silage, tobacco, tomatoes, and cabbage. These crops are grown mainly on flood plains and low rolling hills, except for cabbage, which is grown in the Scaly Mountain community. Ornamental and horticultural crops include Christmas trees, mountain laurel, rhododendron, hemlock, and ginseng; other native trees, shrubs, and herbaceous plants used in landscaping; and hybrid trees, shrubs, and flowers. All of the crops require intensive management and high maintenance. Important Christmas trees species are Fraser fir, eastern white

pine, and Norway spruce. Landscaping plants are becoming more common on small acreages in the coves and on the flood plains of the low and intermediate mountains.

Water Management

Soils on flood plains are flooded at varying frequencies from year to year. In any given year, however, Dellwood, Nikwasi, and Reddies soils are subject to flooding more often than Rosman and Arkaqua soils. Rosman and Arkaqua soils are along streams that have deeper, better defined channels. Crop loss because of flooding is always possible during the growing season on soils that are on flood plains. Ponding is common on Toxaway soils.

Obtaining good yields in areas of the Toxaway and Nikwasi soils requires a drainage system. Seeps and springs cause a few wet areas in Saunook, Whiteside, Santeetlah, and Tuckasegee soils. Subsurface tile is used to drain these soils.

Management of surface water is important on cropland. Most of the cropland in the county is downslope from steeper upland soils. Runoff from these uplands causes a hazard of erosion in the areas of cropland. Overland flow that starts in the uplands should be controlled entering and leaving the cultivated areas. Stripcropping, diversions, and grassed waterways reduce the hazard of erosion. Onsite investigation is essential before proper management can be determined.

Safe outlets are needed for water flowing into orchards from higher lying areas and for water flowing out of orchards. Field borders and diversions that empty into grassed waterways dispose of water without causing erosion. Access roads should be graded to allow for safe disposal of water. Perennial vegetation should be used between rows of trees and on all roads and erosion-control structures. Rows should be laid out on the contour and as nearly parallel as possible. This layout controls erosion and allows easy access. All rows should be planned so that short or dead-end roads, which make equipment access difficult, are prevented.

Tilth

Soils with good tilth have adequate aeration, a high rate of water infiltration, a high water holding capacity, and a low seedling mortality rate. Surface crusting is not a problem. Soil properties associated with good tilth are a loamy texture and moderate to high amounts of organic matter in the topsoil.

Surface crusting is a management concern affecting soils on the flood plains. If surface water outlets are closed, overland flow is ponded on the flood plains. The fine textured material in the soils collects on the surface and dries to form a hard crust. Tillage patterns should be designed to prevent blockage of the outlets. The outlets may need to be redesigned or new outlets may be needed to drain surface water from ponded soils. Maintaining a moderate or high content of organic matter in the topsoil increases the infiltration rate and minimizes ponding. Land smoothing may be needed to prevent ponding.

Most of the soils in Macon County that have a slope of less than 4 percent have good tilth. Eroded areas where the surface layer has a higher content of clay and a lower content of organic matter generally have poor tilth. These areas are susceptible to further erosion and thus further deterioration of tilth.

Tilth is adversely affected by continuous cropping without erosion control and without additions of organic matter and by surface compaction caused by heavy farm equipment, especially during wet conditions. Controlling erosion, planting cover crops, using sod based rotations, properly using crop residue, and applying manure can improve or maintain tilth. Care should be taken to restrict equipment use when the soil is wet.

Erosion Control

Soils that are used as cropland and that have a slope of more than 4 percent are the most susceptible to erosion. Unprotected areas of Braddock, Brasstown, Junaluska, Cowee, Saunook, Evard, Fannin, Hayesville, and Dillsboro soils are easily eroded. Edneyville, Chestnut, Tuckasegee, and Whiteside soils around the Scaly Mountain community are particularly susceptible. This part of the county has annual rainfall of more than 80 inches. Erosion is costly for several reasons. The loss of topsoil, water, pesticides, fertilizers, lime, and organic matter reduces productivity and pollutes streams, lakes, and reservoirs. Trout streams are especially sensitive to damage caused by sediments.

Conservation tillage is the most effective erosion-control measure used in the county. Soil and water are conserved by providing a year-round cover, such as stubble left during no-till farming. No-till farming also minimizes evaporation during the growing season.

Stripcropping is an effective erosion-control measure. It uses rotations of crops and grasses, crop residue, and cover crops to control erosion and conserve water. Diversions and grassed waterways work well with stripcropping. These methods are practical in most cropped areas in the county where erosion is a hazard. They can be adapted to a wide range of slope patterns.

Chemical Weed Control

The use of herbicides for weed control is a common practice on the cropland in Macon County. It decreases the need for tillage and is an integral part of modern farming. Selected soil properties, such as organic matter content and texture of the surface layer, affect the rate of herbicide application. Estimates of both of these properties were determined for the soils in the county. Table 15 shows a general range of organic matter content in the surface layer of the soils. The texture of the surface layer is shown in the USDA texture column in table 14.

In some areas the organic matter content projected for the different soils is outside the range shown in the table. The content may be higher in soils that have received high amounts of animal or manmade waste. Soils that have recently been brought into cultivation may have a higher content of organic matter in the surface layer than similar soils that have been cultivated for a long time. Conservation tillage can increase the content of organic matter in the surface layer. A lower content of organic matter is common where the surface layer has been partly or completely removed by erosion or land smoothing. Current soil tests should be used for specific organic matter determinations.

Soil Fertility

The soils in Macon County generally are low in natural fertility. They are naturally acid. Additions of lime and fertilizer are needed for the production of most kinds of crops.

Most of the ornamentals grown in the county are nutrient specific. No general recommendations can be made. Soil tests and leaf analyses should be performed regularly, and the results should be carefully used.

Lime and fertilizer should be applied in orchards to maintain the sod and produce the desired yield. The results of soil tests and leaf analyses should be used to develop a fertilizer program.

Assistance concerning site selection, soils information, fertility, and layout for the production of ornamentals is available from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Liming requirements are a major concern on cropland. The acidity level in the soil affects the availability of many nutrients to plants and the activity of beneficial bacteria. Lime also neutralizes exchangeable aluminum in the soil and thus counteracts the adverse effects of high levels of aluminum on many crops. Liming adds calcium (from calcitic lime) or calcium and magnesium (from dolomitic lime) to the soil.

A soil test is a guide to what amount and kind of lime should be used. The desired pH levels may differ, depending on the soil properties and the crop to be grown.

Nitrogen fertilizer is required for most crops. It is generally not required, however, for clover or for alfalfa that is established. A reliable soil test is not available for predicting nitrogen requirements. Appropriate rates of nitrogen application are described in the section "Yields per Acre."

Soil tests can indicate the need for phosphorus and potassium fertilizer. They are needed because phosphorus and potassium tend to build up in the soil.

Site Selection and Field Layout

Site selection and field layout are extremely important to the production of many ornamental and horticultural crops. Soils that have a content of clay of less than 15 percent should not be used for ornamentals that are balled and burlapped because the soil will not cling together and thus a poor ball is produced. Wet soils, natural drainageways, and soils that have a content of clay of more than 30 percent should not be used because they hold excess moisture around roots, resulting in poor growth and the possibility of phytophthora root disease. Soils that have a slope of more than 30 percent should not be used because they pose a hazard to mowing, spraying, and harvesting equipment. These steep and very steep areas increase labor costs and harvest times. They also have a detrimental effect on the shape of the plants.

Sites selected for ornamentals should have an adequate supply of clear water for spray water and possible irrigation. During planting care should be taken so that as small an area as possible is disturbed and thus excessive erosion is prevented. Areas between plants and between rows should have a permanent cover of sod.

Site selection, erosion control, and layout are the most important management considerations when an orchard is planned. Sites that are sloping have good air drainage, which is necessary to prevent frost and freeze damage during bloom and bud stages. Sites that are gullied or that have many ravines or abrupt changes in slope should not be used. Selecting sites near an adequate supply of water for spray water and possible irrigation is very important. Very deep, well drained soils that have a loamy subsoil are best for apple trees. Very deep, well drained, clayey soils commonly are used for orchards in other counties in North Carolina. Dillsboro, Braddock, Evard, Edneyville, and Hayesville soils are suited to apple orchards. Wet soils, seeps, and natural drainageways are poor sites. They produce low yielding trees that are more susceptible to disease. Spivey, Cullasaja, Rosman, and Dillard are good examples of

soils that occur in these undesirable areas and thus should not be used.

Access roads are very important to an orchard. These roads should be located carefully and planted with perennial vegetation as soon as possible after construction. Sharp turns, grades above 10 percent, wet areas, and natural drainageways should be avoided so that equipment can be easily operated. Water bars and culverts should be installed where needed.

Fraser fir trees are best adapted to cool sites at elevations of more than 3,500 feet. They are, however, grown at elevations as low as 2,000 feet. The lower the elevation, the more important the site selection. Well drained, loamy soils in areas where annual rainfall is more than 55 inches are best. Most of the gently sloping and strongly sloping, very deep, well drained soils in the high and intermediate mountains are well suited to Fraser fir. Sites for Fraser fir at the lower elevations should have a moderate organic matter content and be on cool aspects. Rosman, Statler, and Saunook soils may have these characteristic. Sites for Fraser fir that are below 2,500 feet, are on south- or west-facing slopes, or where the subsoil contains more than 35 percent clay are marginal. Sites that have two of these factors generally are eliminated for fir production.

White pine and Norway spruce are adapted to dryer and warmer sites. They also tolerate clayey soils. A minimum of 15 percent clay is needed for these ornamentals to be balled and burlapped satisfactorily. Evard, Cowee, Hayesville, Brasstown, Junaluska, Braddock, Dillsboro, and Saunook soils are suited to these species.

The county has a small acreage of native ornamentals, such as mountain laurel, rhododendron, eastern hemlock, Carolina hemlock, hybrid ornamentals, and other woody ornamentals. These plants do well in loamy, well drained soils. The content of clay must be between 15 and 30 percent for the plants to be balled and burlapped. These plants should be protected from winter winds, especially at high elevations. Saunook, Statler, Evard, Cowee, Brasstown, and Junaluska soils are well suited to native ornamentals.

Christmas trees should be planted on a grid spacing that allows easy access for mowing and spraying equipment, commonly 5 feet by 5 feet. Line-out beds for conifers require soils that have less than 10 percent clay in the upper 12 inches. Soils that have more than 10 percent clay hold seedling roots too tightly, resulting in tearing and breaking of roots during harvest. This damage reduces seedling vigor during transplantation. Soils that have a surface layer of fine sandy loam are suited to line-out beds. An example is the Rosman soils.

Access roads should be planned and constructed carefully. Roadbeds that have a grade of more than 10 percent, natural drainageways, and wet areas should not be used. Roads should be surfaced or seeded with perennial vegetation as soon as possible after construction. Lime and fertilizer should be applied regularly to maintain the sod. Cut and fill slopes should be stabilized with vegetation as soon as possible.

Pasture

The management of pasture in Macon County poses a wide range of challenges. Some pastures contain a wide range of soil types in an individual field. In many pastures, wet bottom-land soils, such as Toxaway and Nikwasi soils, are adjacent to steeper, drier soils, such as Braddock, Evard, Fannin, and Hayesville soils. Some pastures on side slopes, on toe slopes, and in coves have seeps and springs. Because of these landscape conditions, droughtiness and wetness can occur in the same pasture. Many pastures are in areas of eroded Braddock and Hayesville soils, which are more droughty and subject to compaction than the other soils.

Pastures on mountain ridges and steep side slopes at elevations of more than 4,000 feet are subject to extreme winter conditions, especially on north-facing slopes. On south- and west-facing slopes, these pastures can be damaged by frost heave. They are subject to early and late winter conditions that greatly shorten the growing season. They also receive more rainfall than pastures in the lower areas. These weather conditions make establishment, maintenance, and management of pastures more difficult.

The best yields of forage are on nearly level to strongly sloping, well drained and moderately well drained soils on flood plains, on terraces, in coves, and in drainageways. Examples are Rosman, Reddies, Statler, Dillard, Dillsboro, Saunook, and Tuckasegee soils. Because these soils also are the most productive cropland, however, forage is commonly grown on eroded or moderately steep soils on side slopes and ridges. Somewhat poorly drained and very poorly drained soils on flood plains and terraces also are commonly used for pasture and hay.

Forage yields in the county can be increased by controlling erosion, using improved plant varieties, applying fertilizers and lime according to the results of soil tests, and using rotational grazing by cross fencing.

Generally, a complete fertilizer is needed at the start of a fertility program. Nitrogen commonly is the most needed element. Because a reliable soil test for nitrogen is not available, nitrogen is usually applied according to the needs of the forages. Soil tests are needed to determine the proper amounts of phosphorus

and potassium to apply. In an established pasture, the quality of the forage can be greatly enhanced by further applications of nitrogen. Chemical fertilizers are the most popular and convenient source of nutrients. Manure can be used as a supplement.

Proper timing of the application of fertilizer is very important. As a general guideline, fertilizer should be applied to cool-season forage before periods of maximum growth. If the application of fertilizer is not properly timed, the number of grazing days is reduced.

In Macon County, pasture species are needed that can produce large amounts of high-quality forage under a wide range of soil conditions. Fescue is an example. It thrives on soils that are well suited to forage production. It can grow very well on soils that have a seasonal high water table or a clayey texture and in eroded areas. It is very important to the livestock industry in the county.

Fescue is an excellent companion crop for legumes, such as ladino clover or red clover, in pasture mixtures. Seeding a legume with fescue adds to the palatability and nutritive value of the forage and decreases the need for nitrogen fertilizer.

Kentucky bluegrass is used as a pasture species on some of the soils in the county. It is a preferred species for horses and sheep. The condition of pastures of bluegrass can be improved by high-analysis phosphate fertilizers, which encourage the growth of native white Dutch clover and increase the quality and nutritive value of the forage.

Orchardgrass is another important species in the county. It can grow anywhere fescue thrives, except wet areas. Hemphill, Nikwasi, and Toxaway soils are commonly wet. Orchardgrass has requirements similar to those of fescue but is more sensitive to abuse. Overgrazing and competition from weeds reduce the lifespan of an established stand. Rotational grazing is important to extending the life of orchardgrass.

Alfalfa had been grown extensively in the county but was phased out of production because of a large population of alfalfa weevils. Because of new resistant varieties and improved pesticides, however, alfalfa production is again increasing. Alfalfa grows best on well drained, loamy or clayey soils, such as Junaluska, Brasstown, Hayesville, Braddock, Dillsboro, Statler, Saunook, and Evard soils. Alfalfa grows poorly on wet soils, such as Nikwasi, Hemphill, and Toxaway soils.

Annual summer grasses, such as sudangrass, sorghum-sudan hybrids, and millet, can be valuable in providing silage, grazing, and hay in a forage program. These grasses can be used for summer forage when cool-season grasses become dormant. Establishment costs, however, must be borne annually. Summer perennials, such as switchgrasss and big bluestem, are preferred because the costs of establishment and maintenance and the hazard of erosion are reduced.

Winter cover crops, such as winter wheat and rye, can be used for limited grazing in winter. They can supplement and extend the feeding of baled hay to livestock.

In Macon County, nearly year-round pasture can be produced by using cool-season grasses, alfalfa, and clover and warm-season perennials as permanent pasture and using annual summer grasses and winter cover crops for temporary forage.

Soils that have a slope of more than 30 percent generally are too steep for farm equipment. Fertilizer and lime must be applied by hand, or access roads must be built for the equipment. Hand application of fertilizer and lime generally is uneven and results in poor stands of pasture, which support few cattle. A poor plant cover encourages erosion, the growth of unwanted weeds, and encroachment of shrubs and trees along field borders. Where access roads are not economically feasible or fertilizer and lime are not regularly applied by hand, the production of trees helps to control erosion and brings a greater economic return than pasture.

Erosion is a hazard affecting the establishment and rejuvenation of pasture in areas where the slope is more than about 4 percent. Proper planting dates should be used to ensure a good stand in a timely manner.

Generally, plowing is not recommended for forage establishment or renovation. In plowed areas the soil crusts after a rain, resulting in a high seedling mortality rate and a severe hazard of erosion. Minimum tillage, applications of herbicides, and a system of planting in the existing sod or stubble should be used for establishment and renovation. The texture of the surface layer and the content of organic matter should always be considered before herbicides are applied.

Large amounts of erosion and downstream sedimentation occur along watercourses where livestock travel along streambanks. Excessive erosion can be prevented by fencing livestock away from streambanks and installing watering facilities.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification also is shown in the table.

The yields are based mainly on the experience and

records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; control of weeds, plant diseases, and harmful insects; maintaining suitable soil pH and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

A high level of management includes maintaining proper soil reaction and fertility levels as indicated by standard soil tests. The application rate of nitrogen for corn on soils that have a yield potential of 125 to 150 bushels per acre should be 140 to 160 pounds per acre. If the yield potential for corn is 100 bushels per acre or less, a rate of 100 to 120 pounds of nitrogen per acre should be used. The application of nitrogen in excess of that required for potential yields generally is not recommended. The excess nitrogen fertilizer that is not utilized by a crop is an unnecessary expense and causes a hazard of water pollution. Because nitrogen can be readily leached from sandy soils, applications may be needed on these soils more than once during the growing season.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the North Carolina Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for use as cropland *(10)*. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode, but they have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main hazard is the risk of erosion unless a close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

There are no subclasses in class I because the soils of this class have few limitations. The soils in class V are subject to little or no erosion, but they have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation. Class V contains only the subclasses indicated by *w*, *s*, or *c*.

The capability classification of each map unit is given in the section "Detailed Soil Map Units" and in table 6.

Woodland Management and Productivity

Albert Coffey, forester, Natural Resources Conservation Service, and Sara A. Browning, soil scientist, U.S. Forest Service, helped prepare this section.

The woodlands are one of the most important resources in Macon County. They provide forest products, scenic beauty, wildlife habitat, outdoor recreation, clean water, and clean air. Timber production, outdoor recreation, and wildlife habitat commonly are competing uses. Woodland managers are challenged to balance these uses. As more land is reserved for outdoor recreation and wildlife, timber managers are challenged to produce greater yields from smaller areas. Meeting this challenge requires intensive management and silvicultural practices.

Many modern silvicultural techniques resemble those long practiced in agriculture. They include establishing, weeding, and thinning desirable young stands; propagating the more productive species and genetic varieties; providing short rotations and complete fiber utilization; controlling insects, diseases, and weeds; and improving tree growth by applications of fertilizer. Even though timber crops require decades to grow, the goal of intensive management is similar to the goal of intensive agriculture. This goal is to produce the largest quantity of the highest quality forest products at the lowest possible cost.

Commercial forests cover much of the land area of Macon County. Commercial forest is land that is producing or is capable of producing crops of forest products and that has not been withdrawn from timber production. Timber sites are evaluated for volume per acre, species, and quality. Yellow-poplar grows fast, is adapted to many of the soils in the county, produces the highest average volume per acre, and is easy to establish and manage.

Quality northern red oak, black cherry, white oak, and sugar maple bring the highest value per unit of timber. They are in short supply. They grow slower, are more site specific, and are more difficult to establish and manage than other species. Low-quality timber and forest products from any species bring reduced prices. The total volume of wood produced by a stand of timber is not the best indicator of the value of the site. Species composition and quality are as important as volume. The difference in value between high- and low-quality forest products cannot be stated too strongly.

Much of the woodland in Macon County has been "high graded" in the past. These stands have few trees of the valuable, high-quality species. To convert these sites to the production of high-value species commonly requires clearcutting, which is the fastest way to grow quality timber on these sites. Because a quality stand of hardwood timber can take more than a lifetime to grow, however, most landowners choose not to clearcut and reestablish hardwoods.

For management purposes timber sites are generally placed in a forest type group, such as yellow-poplar, oak-hickory, northern red oak, yellow pine, and eastern white pine *(8)*. The characteristics of a given site commonly are indicated by the forest type on the site. In places the effects of past management determine the current forest type. Some sites are well suited to more than one forest type.

Yellow-poplar. This forest type most commonly is in coves and drainageways. It produces the highest volume of wood per acre of all the forest types in the county. Yellow-poplar is, by far, the most common species in areas of this forest type. Stands also have varying numbers of northern red oak, white oak, black cherry, sweet birch, eastern hemlock, black locust, American basswood, sugar maple, and yellow buckeye. At elevations of more than 4,000 feet, yellow-poplar is less dominant and northern red oak, black cherry, sweet birch, yellow birch, hemlock, beech, and sugar maple are more common. Northern red oak, white oak, black cherry, and sugar maple are more valuable than yellow-poplar. They are favored in timber management practices. Soils that commonly support this forest type include Saunook, Tuckasegee, Cullasaja, Spivey, and Santeetlah soils.

Oak-hickory. This forest type is on side slopes and ridges on south to west aspects at elevations as high as about 4,800 feet. It is the most extensive forest type in the county. It produces the lowest volume of wood per acre and shows the most effects of past high grading. Sites of this forest type are hotter and drier than sites of the northern red oak forest type. If properly managed, this forest type can produce high-quality timber. Predominant species are black oak, chestnut oak, scarlet oak, and hickories. Associated species include white oak, red maple, pitch pine, and eastern white pine. Soils that commonly support this forest type include Chestnut, Cowee, Edneyville, Evard, Fannin, Chandler, Brasstown, Junaluska, Soco, and Stecoah soils.

Northern red oak. This forest type is on uplands that have a cool aspect at elevations of about 3,000 to 5,500 feet. Below an elevation of 4,000 feet, it is mainly on north- to east-facing side slopes. Above an elevation of 4,500 feet, it is on ridges and side slopes of various aspects. Northern red oak is the most common species in this forest type. Yellow-poplar, black cherry, beech, sweet birch, yellow birch, and sugar maple make up a large component of many stands. Various other species that require cool temperatures, such as yellow buckeye and eastern hemlock, are common in some stands. A

large percentage of the trees in this forest type are of valuable species and thus this forest type commonly has the most valuable stands of timber. Soils that commonly support this forest type include Plott, Trimont, and Cheoah soils. Above an elevation of 4,800 feet, the soils that commonly support this forest type are Burton, Craggey, Wayah, and Oconaluftee soils. The soils at an elevations of more than 4,800 feet are not used as sites for commercial timber production. The trees at these higher elevations grow slowly and have poor form because of frequent ice storms and high winds.

Yellow pine. This forest type is in areas that have been cleared of trees and reseeded or planted to pines. It is most commonly on ridges and side slopes in low rolling hills. This forest type covers only a small acreage in the county. Shortleaf pine and Virginia pine are the dominant species. Associated species include dry-site hardwoods, such as scarlet oak, chestnut oak, black gum, and sourwood. Soils that commonly support this forest type include Hayesville, Evard, Cowee, Brasstown, and Junaluska soils.

Eastern white pine. This forest type occurs naturally in a few areas near the town of Highlands. In most areas, however, it has been planted. It is most commonly on ridges and side slopes that previously supported the oak-hickory forest type. These areas were converted because eastern white pine produces more volume and has shorter rotations than the trees of the oak-hickory forest type. Generally, yellow-poplar sites are not well suited to eastern white pine conversion because of plant competition.

One of the first steps in planning intensive woodland management is to determine the potential productivity of the soil for several alternative tree species. The most productive and valued trees are then selected for each soil type. Site and yield information enables a forest manager to estimate future wood supplies. These estimates are the basis of realistic decisions about future expenses and profits associated with intensive woodland management, land acquisition, or industrial investments. Sites can be prioritized for management based on their value or potential value.

The potential productivity of woodland depends on physiography, soil properties, climate, and the effects of past management. Specific soil properties and site characteristics, including soil depth, texture, structure, and depth to the water table, affect forest productivity primarily by influencing available water capacity, aeration, and root development. The net effects of the interaction of these soil properties and site characteristics determine the potential site productivity.

Other site factors are also important. The gradient and length of slopes affect water movement and availability. In mountainous areas, elevation and aspect affect the amount of sunlight a site receives and the rate of evaporation. Sites on south-facing slopes that are not shaded by higher mountains are warmer and drier than sites on north-facing slopes. The best sites are generally on north- and east-facing slopes in the lower areas, in sheltered coves, and in gently sloping concave areas. The amount of rainfall and length of growing season also influence site productivity.

This soil survey can be used by woodland managers planning ways to increase the productivity of forest land. Some soils respond better to applications of fertilizer than others, and some are more susceptible to landslides and erosion after roads are built and timber is harvested. Some soils require special reforestation efforts. In the section "Detailed Soil Map Units," the description of each map unit in the survey area suitable for timber includes information about productivity, limitations affecting harvesting, and other management concerns. Table 7 summarizes this forestry information and rates the soils for a number of factors to be considered in management. *Slight, moderate,* and *severe* are used to indicate the degree of the major soil limitations to be considered in forest management.

Table 7 lists the *ordination symbol* for each soil. The first part of the ordination symbol, a number, indicates the potential productivity of a soil for the indicator species in cubic meters per hectare per year. The larger the number, the greater the potential productivity. Potential productivity is based on the site index and the point where mean annual increment is the greatest.

The second part of the ordination symbol, a letter, indicates the major kind of soil limitation affecting use and management. The letter *R* indicates a soil that has a significant limitation because of the slope. The letter *X* indicates that a soil has restrictions because of stones or rocks on the surface. The letter *W* indicates a soil in which excessive water, either seasonal or year-round, causes a significant limitation. The letter *T* indicates a soil that has, within the root zone, excessive alkalinity or acidity, sodium salts, or other toxic substances that limit the development of desirable trees. The letter *D* indicates a soil that has a limitation because of a restricted rooting depth, such as a shallow soil that is underlain by hard bedrock, a hardpan, or other layers that restrict roots. The letter *C* indicates a soil that has a limitation because of the kind or amount of clay in the upper part of the profile. The letter *S* indicates a dry, sandy soil. The letter *F* indicates a soil that has a large amount of coarse fragments. The letter *A* indicates a soil having no significant limitations that affect forest use and management. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, and F.

Ratings of *erosion hazard* indicate the probability that damage may occur if site preparation or harvesting activities expose the soil. The risk is *slight* if no particular preventive measures are needed under ordinary conditions; *moderate* if erosion-control measures are needed for particular silvicultural activities; and *severe* if special precautions are needed to control erosion for most silvicultural activities. Ratings of moderate or severe indicate the need for construction of higher standard roads, additional maintenance of roads, additional care in planning harvesting and reforestation activities, or the use of special equipment.

Ratings of *equipment limitation* indicate limits on the use of forest management equipment, year-round or seasonal, because of such soil characteristics as slope, wetness, stoniness, and susceptibility of the surface layer to compaction. As slope gradient and length increase, the use of wheeled equipment becomes more difficult. On the steeper slopes, tracked equipment is needed. On the steepest slopes, even tracked equipment cannot be operated and more sophisticated systems are needed. The rating is *slight* if equipment use is restricted by wetness for less than 2 months and if special equipment is not needed. The rating is *moderate* if slopes are so steep that wheeled equipment cannot be operated safely across the slope, if wetness restricts equipment use from 2 to 6 months per year, if stoniness restricts the use of ground-based equipment, or if special equipment is needed to prevent or minimize compaction. The rating is *severe* if slopes are so steep that tracked equipment cannot be operated safely across the slope, if wetness restricts equipment use for more than 6 months per year, if stoniness restricts the use of ground-based equipment, or if special equipment is needed to prevent or minimize compaction. Ratings of moderate or severe indicate a need to choose the best suited equipment and to carefully plan the timing of harvesting and other management activities.

Ratings of *windthrow hazard* indicate the likelihood that trees will be uprooted by the wind. A restricted rooting depth is the main reason for windthrow. The rooting depth can be restricted by a high water table, a fragipan, bedrock, or a combination of such factors as wetness, texture, structure, and depth. The risk is *slight* if strong winds break trees but do not uproot them; *moderate* if strong winds blow a few trees over and break many trees; and *severe* if moderate or strong winds commonly blow trees over. Ratings of moderate or severe indicate that care is needed in thinning or that the stand should not be thinned at all. Special equipment may be needed to prevent damage to shallow root systems in partial cutting operations. A plan for the periodic removal of windthrown trees and the maintenance of a road and trail system may be needed.

Ratings of *plant competition* indicate the likelihood of the growth or invasion of undesirable plants. Plant competition is more severe on the more productive soils, on poorly drained soils, and on soils having a restricted root zone that holds moisture. The risk is *slight* if competition from undesirable plants hinders adequate natural or artificial reforestation but does not necessitate intensive site preparation and maintenance. The risk is *moderate* if competition from undesirable plants hinders natural or artificial reforestation to the extent that intensive site preparation and maintenance are needed. The risk is *severe* if competition from undesirable plants prevents adequate natural or artificial reforestation unless the site is intensively prepared and maintained. A moderate or severe rating indicates the need for site preparation to ensure the development of an adequately stocked stand. Managers should plan site preparation measures to ensure timely reforestation.

The *potential productivity* of *common trees* on a soil is expressed as a *site index* and a *volume* number. Common trees are listed in the order of their observed general occurrence. The table generally lists four to six trees for each applicable map unit. Additional species that commonly occur on the soils may be listed in the detailed soil map unit descriptions. Generally, only two or three tree species dominate. The first tree listed for each soil is the indicator species for that soil. An indicator species is a tree that is common in the area and that is generally the most productive on a given soil.

For soils that are commonly used for timber production, the yield is predicted in cubic feet per acre per year. It is predicted at the point where mean annual increment culminates. The estimates of productivity of the soils in this survey are based mainly on eastern white pine, yellow-poplar, shortleaf pine, northern red oak, chestnut oak, and scarlet oak *(3, 5, 6, 7)*.

The *site index* is determined by taking height measurements and determining the age of selected trees within stands of a given species. This index is the average height, in feet, that the trees attain in a specified number of years (50 years in this survey). This index applies to fully stocked, even-aged, unmanaged stands. Productivity of a site can be improved through management practices, such as bedding, ditching, managing water, applying fertilizer, and planting genetically improved species.

The *volume* is the yield likely to be produced by the most important trees, expressed in cubic feet per acre per year.

Trees to plant are those that are used for

Figure 8.—A stream in a scenic area in Macon County.

reforestation or, under suitable conditions, natural regeneration. They are suited to the soils and can produce a commercial wood crop. The desired product, topographic position (such as a low, wet area), and personal preference are three factors among many that can influence the choice of trees for use in reforestation.

Recreation

A variety of recreation activities are available in Macon County. Nantahala Lake provides a wide range of water-related activities. The National Forests are the base for recreational hunting. People visiting the area can play golf, fish, hike, boat, camp, hunt, or sightsee (fig 8).

In table 8, the soils of the survey area are rated according to the limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also

important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 8, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 8 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 11 and interpretations for dwellings without basements and for local roads and streets in table 10.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have gentle slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes, stones, or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

John P. Edwards, biologist, Natural Resources Conservation Service, and Joffrey Brooks, wildlife biologist, North Carolina Wildlife Resource Commission, helped prepare this section.

Small game and nongame species live throughout Macon County. Some of the small game species and important furbearers are gray squirrel, raccoon, rabbit, fox, grouse, dove, and bobcat. Waterfowl populations are low but include a small population of wood ducks along the Little Tennessee River and on lakes and some farm ponds. The wide assortment of nongame wildlife includes hawks, many species of songbirds, and a variety of small mammals and reptiles. The Nantahala National Forest supports a majority of the big game populations, notably deer, turkey, and black bear.

Every wildlife species requires food, water, and cover. The variety and abundance of wildlife in an area depends largely on the variety and abundance of these basic elements. Some species require greater amounts of food, water, and cover than others and thus require a much greater amount of space in which to live. For example, black bears require much more space than deer or gray squirrels. The amount of food, water, and desirable cover is dependent upon many factors, including soil properties. Given the opportunity, wildlife roam through and occupy areas of the most productive soils. These soils produce the best food, have a dependable water supply, and support a desirable plant cover.

Some of the most productive soils on private land in the county are along streams, along the Little Tennessee River, and in coves. These areas are used for a variety of human activities, including farming and residential, industrial, and recreational uses. Most of these activities preclude use of the land by many wildlife species. Wildlife, especially big game, are forced to move to areas of less desirable soils, which support less desirable habitat. Soils that are rated in Table 9 as having a good potential for providing wildlife habitat do not necessarily support a large population of wildlife. For example, although Rosman, Saunook, Braddock, Evard, and Hayesville soils are rated as having good potential to support habitat for woodland wildlife, these soils are intensively used for farming and housing, forcing woodland wildlife elsewhere. Other soils, such

as Edneyville, Chestnut, and Plott soils, that are rated as having good potential for woodland wildlife habitat are mostly wooded, but cattle are given access to the woods and outcompete big game, forcing the wildlife to Federal lands or to areas of less desirable soils and habitats.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 9, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat. The ratings in the table are intended to be used as a guide and are not intended to be site specific. Onsite investigation is needed for individual management plans.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, and pokeberry.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, the available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are autumn-olive and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, cattail, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain

and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, meadowlark, field sparrow, cottontail rabbit, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, white-tailed deer, and black bear.

Habitat for wetland wildlife consists of open, swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, muskrat, mink, and beaver.

Most soils that are good for wildlife habitat also are good for other uses and thus the wildlife is commonly pushed out of these areas to places that have little use for humans. In many areas humans could share the land with wildlife. Many things could be done to enhance wildlife populations in these areas.

Small game and numerous nongame species thrive best in transitional zones that are maintained in early successional stages. Examples of transitional zones are fence lines, field borders, woodlot perimeters, roadsides, ditches, and powerline right-of-ways. Transitional zones can be managed with little expenditure of time or money. Macon County, which has numerous woodlots and small farms, has thousands of miles of transitional zones available for wildlife management. This management can include using controlled burning, establishing wildlife plantings, disking, mowing, and leaving unharvested crops along field edges. Wildlife occupies and thrives in properly maintained habitat.

Some opportunity exists for managing acreages of private woodland for woodland wildlife habitat. Wildlife management plans usually begin with timber management. Table 7 can be used to determine the type of forest regeneration best suited to a soil. Timber harvesting and reforestation are an integral part of a wildlife management plan.

Irregularly shaped clearcuts of less than 25 acres in large, even-aged stands of timber can benefit many species of woodland wildlife, such as deer or grouse. Where timber or firewood is cut, leaving some snags or older trees provides habitat for cavity nesters, such as woodpeckers, and den sites for raccoons and squirrels.

Unusually large trees, uncommon tree species, and some mast bearing trees and shrubs should be left uncut when forests are thinned. Seeding roadcuts and access roads with clover, sericea lespedeza, and orchardgrass provides a food source for wildlife and helps to control erosion. Habitat that protects game species from predators can be promoted by planting evergreen cover strips at strategic locations in a woodlot. A variety of habitat for a variety of wildlife is an important objective in wildlife management. Maintaining well dispersed groups of different aged timber in stands that include some variety of species is a key to overall benefits for wildlife.

Knowledge of the habits, habitat requirements, and favorite foods of different wildlife species is a tool for managing the species. A short description of the important game species and furbearers in Macon County follows. Some habitat requirements, possible soils to support the habitat, and a partial list of foods for each species are described.

Black Bears require 5,000 acres or more of mature forest to obtain sufficient food and cover. In Macon County most of the appropriate areas are in the Nantahala National Forest. These animals, however, do range over some tracts of private land.

Black Bears are omnivorous, feeding on acorns, beechnuts, cherries, apples, grapes, blackberries, blueberries, greenbrier, various grasses and varieties of clover, blackgum, hawthorns, small mammals, insects, carrion, and garbage. Some farm crops, such as corn, are taken by black bears, and beehives occasionally are damaged. Preferred den sites for black bears are old, large, hollow, standing trees, especially chestnut oak. Such soils as Edneyville, Chestnut, Evard, Cowee, Stecoah, and Soco soils support these preferred sites.

The loss of habitat to housing and recreational developments in mountainous areas is the greatest threat to the harvestable population of black bears. This space in which to live cannot be replaced, and habitat pressures thus exerted can cause permanent declines in black bear populations.

The habitat requirements for white-tailed deer can be met on a much smaller range than those of the black bears. An area of 300 to 500 acres can support deer where proper amounts of food, water, and cover exist. In spring and summer, foods taken by deer include green succulent leaves and stems of both woody and herbaceous species. In fall, acorns, honeysuckle, grapes, apples, and leaves of woody species are important foods. In winter, acorns, honeysuckle, rhododendron leaves, and grasses are important foods. Deer prefer the acorns of white oak found on warm, dry soils, such as Edneyville, Chestnut, Evard, Cowee, Stecoah, Soco, Junaluska, and Brasstown soils. Northern red oaks, however, are more consistent producers of mast in the county than the white oaks and thus are more important as a source of food. Cool, moist soils, such as Plott, Tuckasegee, Trimont, Cheoah, and Cullasaja soils, are best for northern red oaks. Agricultural crops are an important source of food

where they are available within the deer's range. The deer browse crops and pasture on private land in most of the agricultural communities throughout the county.

Some potential exists for increased expansion of deer populations on private lands in the county. Owners of 20 to 50 acres can contribute to the deer population by considering their land as part of the deer's range and identifying what is limiting in the range. The landowners can provide the limiting food or cover needed to support more deer.

Wild Turkeys require a variety of habitat and generally range over large acreages (5,000 acres) to obtain food. They eat green herbaceous leaves and forbs, berries and other fruits, insects, and acorns and dogwood berries in season. Grassy openings are beneficial to turkey poults in the spring. These openings allow the young to obtain a diet high in insects, which promotes quick growth. The presence in the range of some stands of mature hardwoods, such as oak and hickory, that have an open understory is an important part of the wild turkey's winter range. These stands of hardwoods grow mostly on warm, dry mountainsides on such soils as Edneyville, Chestnut, Evard, Cowee, Stecoah, Soco, Trimont, Brasstown, and Junaluska soils.

Raccoons are nocturnal mammals. They are omnivorous, eating about anything. Their diet includes fleshy fruits, acorns, corn, persimmons, blackgum, invertebrates, small mammals, snakes, lizards, salamanders, bird eggs, young birds, carrion, and garbage. Harvesting for timber and firewood that leaves den trees and some mast bearing trees and shrubs improves the habitat for raccoons. Protecting streams and streamside areas from degradation by cattle or clearing operations is important because much of the raccoon's food and many of its travel lanes are near waterways.

Mink are predatory animals. They feed mainly on animal life associated with water. They live mainly in coves and on stream terraces and flood plains. Their diet includes fish, frogs, crayfish, mice, songbirds, snakes, lizards, salamanders, rabbits, squirrel, muskrat, and any other animal they can readily catch.

Muskrats are essentially vegetarian. They eat roots, stems, bark, fruit, and leaves of various plants. Among their favorite foods are grasses, clover, corn, and many forms of marsh vegetation. They occasionally eat animal matter, including fish, freshwater mussels, insects, crayfish, and snails.

Red squirrels and gray squirrels, which are commonly called mountain boomers, live in the county. Generally, gray squirrels live on any landscape position below an elevation of about 4,500 feet where mast and den trees are available. These landscapes include all of the soils in the county classified in the mesic temperature regime (see table 18). Gray squirrels prefer hardwood mast over pine mast. Although red squirrels live wherever mast and den trees are available, they prefer landscapes above an elevation of about 4,500 feet. These landscapes generally include all of the soils in the county classified in the frigid temperature regime. The preferred foods of the squirrels are acorns, beechnuts, blackgum, black cherry, corn, dogwood berries, hickory nuts, mulberries, pine mast, chestnuts, hazelnuts, walnuts, butternuts, chinquapin, poplar flowers, and wild grapes.

Rabbits and quail are generally referred to as "farm game species." On many farms, a lack of cover is the factor limiting good quail and rabbit populations. Modern farming technology has eliminated field edges and odd corners. Fence rows are no longer left supporting briers or brush. The changes in crops have also affected rabbit and quail populations. In pasture and hayland, the dominant use of fescue instead of other grass-clover mixtures has adversely effected the food component of habitat for rabbits and quail on farms. Important cover components for rabbits and quail on farms include patches of blackberry, greenbrier, and honeysuckle; fallow fields; and early evergreen plantations. Some of the rabbit's favorite foods include clover, lespedeza, and twigs and bark of several woody species. The preferred food of the quails includes seeds of a variety of lespedeza, blackberries, dogwood berries, cowpeas, millet, buckwheat, waste grain, clover, alfalfa, and a variety of insects.

Gray fox and red fox live in the county. Generally, gray foxes live in woodlands and red foxes live in farmlands. These animals eat mice, rats, rabbits, songbirds, and a variety of coldblooded vertebrates. They also eat grapes, corn, acorns, apples, pokeberries, and persimmons. Generally, habitat improvement practices that benefit small game populations also benefit fox populations. Mice and other rodents are a main component of the fox diet, which benefits farmers.

Ruffed grouse live in a variety of habitats in the county. The more commonly taken foods are acorns, beechnuts, wild grapes, blackberries, tender leaves, strawberries, serviceberries, and dogwood berries; the buds of beech, maple, and apple; and rose hips. Grouse require some evergreen cover within their range for shelter. This cover can be small patches of pine on warm, dry sites or rhododendron-laurel thickets on cool, moist sites. In forested tracts, clearcutting irregularly shaped areas 1 to 5 acres in size is a good management technique. This provides an area for grouse to feed on a variety of insects, buds, grasses, forbs, and fruits. These cleared areas provide a variety

of food for several years after the initial timber cutting operation.

Bobcats are very shy predators that hunt mostly at night. They feed on rabbits, mice, snakes, squirrels, woodchucks, and birds. Woodland cover is an important component of the bobcat's habitat. These animals prefer very thick cover in which to hide in daylight hours.

Woodchucks, or groundhogs, are numerous in the county. They are popularly hunted. They live in a variety of habitat, including pasture, fallow fields, grassy roadsides, cropland, and woodland. They prefer areas where they can obtain their favorite foods, which are grasses, clover, and a variety of annual plants. They also feed on apples, garden crops, and acorns. Woodchucks feeding on garden crops are an annual problem in the county.

Woodchucks are important to other wildlife. Abandoned woodchuck dens can be used by rabbits, foxes, raccoons, chipmunks, and snakes. Woodchucks also are important as a food item for foxes, bobcats, and various birds of prey.

Brown, rainbow, and brook trout are abundant game fish in many creeks and streams in the county. High elevations and woodland cover create the cool water necessary for trout to flourish. Of the three species, only the brook trout is native to the mountain waters. Trout habitat is clearly effected by land and water uses. Erosion-control efforts and public support for pollution control are important to keeping trout waters productive and to cleaning up potential trout waters. Protecting streams and waterways from siltation and various pollutants helps preserve the trout fishery and could increase the recreational fishery resource in the county.

Several trout ponds are in the county. Soils associated with trout farms are in coves that have seeps, springs, and perennial branches for water supply. Examples are Saunook, Spivey, Tuckasegee, and Whiteside soils. These soils are good filters and thus yield clean water. Other soils on sandy flood plains, such as Dellwood soils, are along fast streams that have a good amount of fall. These soils are next to cool water that has a high content of oxygen, which is necessary for trout production.

Engineering

Howard C. Tew, civil engineer, Natural Resources Conservation Service, helped prepare this section.

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in

this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Some of the soils in Macon County can be easily developed by conventional engineering design techniques. Others require a considerable number of specialized engineering and construction techniques because of inherent limitations. If construction problems are to be prevented, the planning of any engineering activities must include consideration of the landscape and the limitations of the soils. Several of the tables at the back of this publication include information that can be used for evaluating limitations of the soils as potential construction sites.

A number of soil characteristics pose engineering difficulties in the county. Many of these characteristics are inherent to mountainous terrain and climate. Among the most important characteristics are landscape position, slope, erodibility, instability caused by poor bearing or shear strength, stoniness, freeze-thaw action, seeps and springs, shallow depth to bedrock, and shrink-swell potential.

Landscape position.—Before any engineering project is started, the identification of landscape site conditions is important. Important site characteristics include location, such as ridges, side slopes, coves, and flood plains; runoff or run-on characteristics; frequency of flooding; presence of a seasonal high water table within a depth of 6 feet; intensity of intermediate runoff from surrounding uplands; and available precautions to carry water across the site without causing damage to the land or diminishing the quality of the water. These factors should be carefully evaluated before construction begins.

Slope.—Most of the soils in the county have a slope ranging from 15 to 95 percent. Slope directly or indirectly influences the use of a soil in a number of ways. As slope increases, access roads require deeper cuts and longer fill slopes, buildings require stronger foundations, and septic tank absorption fields require more specialized design. Slope may not be the overriding factor, however, when comparing soils.

Because the slope is a severe limitation on all soils that have a slope of more than 15 percent, comparisons between these soils are difficult. Comparing secondary limitations for a given purpose may be more important. For example, Edneyville-Chestnut complex, 30 to 50 percent slopes, stony, and Cleveland-Chestnut-Rock outcrop complex, windswept, 15 to 30 percent slopes, both have severe ratings for septic tank absorption fields because of depth to bedrock and slope. The Edneyville-Chestnut complex, however, is better for this use because the Edneyville soil does not have the limitation of depth to bedrock.

Rainfall causes runoff from watersheds that results in high peak rates and flow velocities. The design of water flow and impoundment structures must meet exacting standards to provide for this runoff. Ponds and sediment basins are likely to be damaged or may washout if design and construction are not performed properly considering the complicating factors imposed by these watersheds. Damage to downstream areas and subsequent liability in case of a failure are primary considerations of design.

Erodibility.—Slope and lack of ground cover are the dominant factors contributing to erosion on many soils in the mountains. During construction, the removal of surface cover exposes soil to erosion. If runoff accumulates and moves uncontrolled across a construction site, severe erosion occurs. Unless erosion-control measures are applied, excavations on most soils in the mountains result in severe erosion and offsite damage caused by sediments. Cuts and fills are common during construction on steep and very steep soils. Fill slopes commonly contain material that is dominated by saprolite and rock fragments. The saprolite may be very infertile and very strongly acid or extremely acid. These characteristics make stabilizing the slope with vegetation and preventing erosion difficult.

Instability.—Soil material used in fills and undisturbed soils on construction sites must possess the needed bearing strength to support loads, such as the fill material, buildings, and highways. Undisturbed soils must also provide a degree of shear strength to support their own weight. Additional loading puts greater stress on the soil. When loading stresses exceed bearing or shear strength, soils may move unpredictably. Loading stresses exceed bearing and shear strengths on unstable soil material much more quickly than on stable soil material.

The stability of soil material is influenced by lateral support, lubricants, and slope. Lateral support is from side to side. It helps hold the soil material in place. Undisturbed soils possess this support. Excavations that cut across soils diminish lateral support. Soil material in upslope positions may move downslope, causing damage to roads and structures.

Soil material moves more freely when lubricated. Such lubrication of soils occurs where high concentrations of mica or organic matter are in the soil material. Mica can be detected by a shiny sparkle when a soil is struck by sunlight or other bright light and by a slick, greasy consistence of the soil. Water also serves as a soil lubricant. If a soil becomes saturated, it tends to move away from applied loading forces. Whether

lubricated by natural particle characteristics or by water, soil that moves provides very little shear strength. Micaceous soils and soils with seeps and springs are poor choices for construction sites because of poor strength and susceptibility to slippage and landslides. The Fannin soil, which is on side slopes in the low mountains, is a good example of a soil that has a high content of mica. If fill slopes are used as building sites, detailed engineering testing and design are commonly needed to prevent damage caused by settling and slope failures.

Slope is a major factor affecting soil stability. Keeping the soil material in place becomes more difficult as the slope increases, especially where the material is influenced by reduced lateral support and lubrication.

Soils in the western part of the county are underlain by metasedimentary bedrock. They are less stable than those in the eastern part. The soils associated with metasedimentary bedrock are Cataska, Cheoah, Junaluska, Brasstown, Stecoah, Soco, and Sylco soils. The underlying bedrock lies in plates that are tilted at varying angles. These plates provide very little shear strength and tend to slide across one another when loaded.

Excavations of the rock formations have the same problems of lateral support, lubricants, and slope as excavations of soil material. Because of the platy nature of the rocks, the risk of failure is increased or decreased by the orientation of construction cuts to the plates.

The soils on the flood plains along the Little Tennessee River are composed predominantly of fine sands or silts and have little natural plasticity. These soils may become unstable when saturated. When wet and subjected to excessive loading, these soils, if not bound together by clay, flow in a thick liquid slurry. The Rosman soil is an example. Excavations are difficult to make in such soils and can be dangerous. Side walls tend to cave in and slough off when lateral support is removed. Preventing cave-ins requires extensive shoring of the walls. Some soils are unstable because they have a subsoil that shrinks and swells with fluctuations in the soil water content. Moving soil is a hazard to foundations and buried pipes. Special planning and design of footings, foundations, and underground utilities is required.

Stoniness.—Most soils in the mountains contain varying amounts of rock fragments, ranging from gravel to large stones. Some soils in coves are stony throughout. Examples are Cullasaja and Spivey soils. Other soils in coves have stones in only some part of the profile. Examples are Tuckasegee and Santeetlah soils. Some soils on flood plains contain or are underlain by smooth, water-rounded rock fragments, ranging from fine gravel to large cobbles. Examples are Dellwood, Reddies, and Nikwasi soils. Other soils on flood plains, such as Rosman soils, do not have stones within a depth of 40 inches or more. The content of rock fragments in some soils in the mountains varies from a few fragments to as much as 35 percent of the soil, by volume. Examples are Stecoah and Edneyville soils. The content of rock fragments in other soils in the mountains, such as Cataska soils, is more than 35 percent, by volume. At a specific location, the content of rock fragments may vary greatly through the soil profile.

Construction and other development requires compaction of fill material to provide a firm foundation and impervious layers. Where excess rock fragments in the fill material inhibit compaction, unacceptable settlement is likely to occur, resulting in damage to structures. Compaction of rocky soils fails to produce the homogenous density required in construction of earth dams and other water-retention structures. Shallow excavations and fine grading may be difficult in soils that have excess rock fragments. Deeper excavations may require blasting in some soils, such as Cataska, Cleveland, and Craggey soils. Removal of rock fragments from stony soils is expensive and time consuming.

If soils are analyzed for engineering purposes, the content of stones should receive special consideration. The pedon descriptions in the "Classification of the Soils" section use such terms as gravel, stones, cobbles, channers, flagstones, and skeletal to indicate the presence of stones or rock fragments. Determining specific conditions requires onsite investigation.

Care must be taken when the Unified Soil Classification System is used to evaluate a soil. The classification is based on that portion of the soil having particles smaller than 3 inches in diameter. The Unified Soil Classification for a soil may be shown as SC (sand with clay fines) or CL (low plastic clay), which indicates that the soil is ideal for use as fill material and responds acceptably to compaction; however, the soil may be excessively stony and contain scattered large boulders, which render the soil unsuitable for use as fill.

Many of the soils in the county are very deep or deep. Burton, Cleveland, Cataska, Craggey, and Sylco soils, however, have hard bedrock at a depth of 10 to 40 inches. Hard bedrock requires drilling and blasting. It is identified as an R layer in the "Classification of the Soils" section.

A few soils in the county have weathered bedrock at a depth of 20 to 40 inches. They include Chestnut, Soco, Cowee, and Junaluska soils. Weathered bedrock can be excavated with difficulty by machinery. Material excavated from layers of weathered bedrock is dry, brittle, and hard to pack. These layers are identified as

a Cr horizon in the "Classification of the Soils" section.

The plane of contact between soil material and the surface of the bedrock undulates. Determining the average depth and topography of the contact before construction begins requires onsite investigation.

Freeze-thaw cycle.—The soils in Macon County that are on south-facing slopes are exposed to continual freezing and thawing from November through March. Repeated freeze-thaw cycles in winter create heaving and sloughing of surface soils. Soils that have a moderate to high content of clay are most affected. Frost action loosens the surface of the soil and may heave it above its normal position. Subsequent thawing may leave the surface soil in a near liquid state. In this condition the soil is subject to erosion and has minimal load supporting strength. Unprotected slopes are subject to extreme erosion, and access roads become impassable.

If a thaw does not affect the entire depth of a frozen soil, an unfrozen, heaved layer of soil is left on top of frozen material. Severe erosion can occur if water moves laterally across the surface of the frozen material.

Frost heaving exerts considerable force on footings and foundations in some soils. The potential for frost damage must be considered when structures are designed. Frozen soil resists compaction and should not be used as fill material if compacted densities are important. Depth of frost penetration varies with elevation across the county. North-facing slopes develop frost to greater depths than other slopes. Frost penetration may reach 36 inches in some years at elevations of more than about 5,000 feet.

Shrink-swell potential.—The potential for shrinking and swelling in a soil is influenced by the amount and kind of clay in the soil. Examples of soils in Macon County that have significant shrink-swell characteristics are Braddock, Dillsboro, and Hemphill soils. Visual classification may be sufficient to indicate that a soil definitely does not contain significant amounts of clay. Mechanical analyses, and very commonly Atterberg limit tests, are needed when a soil exhibits characteristics of clayey soils. Soils that have 25 percent or more clay have the potential for significant shrinking and swelling. Tables 10 and 15 identify soils which may exhibit shrink-swell characteristics. Table 15 also provides a range in the content of clay.

Building Site Development

Table 10 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, and shrinking and swelling can cause the movement of footings. Depth to a high water table, depth to bedrock, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock, depth to a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil

properties, site features, and observed performance of the soils. Soil reaction, depth to a high water table, depth to bedrock, and the available water capacity in the upper 40 inches affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established. Soil tests are essential to determine liming and fertilizer needs. Help in making soil tests or in deciding what soil additive, if any, should be used can be obtained from the office of the Macon County Soil and Water Conservation District or the local office of the North Carolina Cooperative Extension Service.

Sanitary Facilities

Table 11 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 11 also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and that good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, depth to a high water table, depth to bedrock, and flooding affect absorption of the effluent. Large stones and bedrock interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. The animal waste lagoons commonly used in farming operations are not considered in the ratings. They are generally deeper than the lagoons referred to in the table and rely on anaerobic bacteria to decompose waste materials.

Table 11 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, depth to a high water table, depth to bedrock, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope or bedrock can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in table 11 are based on soil properties, site features, and observed performance of the soils.

Permeability, depth to bedrock, depth to a water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, and soil reaction affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 12 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* have more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a water table at a depth of less than 1 foot. These soils have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 12, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale, siltstone, and weathered granite saprolite, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such

properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are naturally fertile or respond well to fertilizer and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel or stones, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel or stones, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and releases a variety of plant nutrients as it decomposes.

Water Management

Table 13 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives the restrictive features that affect each soil for drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area. Ponds that are less than about 2 acres in size are not shown on the soil maps because of the scale of mapping.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or mica. Depth to a high water table affects the amount of usable material. It also affects trafficability.

Soils that have a high content of mica, such as the Cashiers, Chandler, and Fannin soils, are poorly suited to use in embankments. The problems resulting from the high content of mica include difficulty in compaction, poor trafficability, susceptibility to erosion, and low shear strength. Also, piping commonly is a problem if the soil material is used to impound water.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock or to other layers that affect the rate of water movement, permeability, depth to a high water table or depth of standing water if the soil is subject to ponding, slope, susceptibility to flooding, subsidence of organic layers, and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Federal and State regulations require that any area designated as wetlands cannot be altered without prior approval. Contact the local office of the Natural Resources Conservation Service for identification of hydric soils and potential wetlands.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The

design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock. The performance of a system is affected by the availability of suitable irrigation water, the depth of the root zone, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to help to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock affect the construction of terraces and diversions. Maintenance of terraces and diversions is adversely affected by a restricted rooting depth, a severe hazard of soil blowing or water erosion, an excessively coarse texture, and restricted permeability.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock affect the construction of grassed waterways. A hazard of soil blowing, low available water capacity, restricted rooting depth, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 17.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 14 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages, by weight, of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, by volume, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20, or higher, for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 17.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-

weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

Physical and Chemical Properties

Table 15 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate, or component, consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence the shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at ⅓-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of movement of water through the soil when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage in each major soil layer is stated in inches of water per inch of soil. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time. It is the difference between the amount of soil water at field moisture capacity and the amount at wilting point.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, more than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE)

to predict the average annual rate of soil loss by sheet and rill erosion. Losses are expressed in tons per acre per year. These estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur over a sustained period without affecting crop productivity. The rate is expressed in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 15, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 16 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils are assigned to one of four groups. They are grouped according to the infiltration of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep or very deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil listed in table 16 is assigned to two hydrologic groups, the first letter is for drained areas and the second is for undrained areas.

Flooding, the temporary covering of the soil surface by flowing water, is caused by overflowing streams, by runoff from adjacent slopes, or by inflow from high tides. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in swamps and marshes or in a closed depression is considered ponding.

Table 16 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency generally is expressed as *none, rare, occasional,* or *frequent. None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year). *Frequent* means that flooding occurs often under normal weather conditions (the chance of flooding is more than 50 percent in any year). Duration is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month). The time of year that floods are most likely to occur is expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information on flooding is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered is local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 16 are the depth to the seasonal high water table, the kind of water table, and the months of the year that the water table commonly is highest. A water table that

is seasonally high for less than 1 month is not indicated in table 16. An apparent water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and the amount of sulfates in the saturation extract.

Engineering Index Test Data

Table 17 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are typical of the series and are described in the section "Soil Series and Their Morphology." The soil samples were tested by the Soil Mechanics Laboratory, Fort Worth, Texas, and by the North Carolina Department of Transportation and Highway Safety, Materials and Test Unit, Raleigh, North Carolina.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); Unified classification—D 2487 (ASTM); Mechanical analysis—T 88 (AASHTO), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 4318 (ASTM); Plasticity index—T 90 (AASHTO), D 4318 (ASTM); and Moisture density—T 99 (AASHTO), D 698 (ASTM).

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Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(11)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or on laboratory measurements. Table 18 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Inceptisol.

SUBORDER. Each order is divided into suborders, primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Umbrept (*Umbr*, meaning shade, plus *ept*, from Inceptisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplumbrepts (*Hapl*, meaning minimal horizonation, plus *umbrepts*, the suborder of the Inceptisols that has an umbric epipedon).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Haplumbrepts.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is coarse-loamy, mixed, mesic Typic Haplumbrepts.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. There can be some variation in the texture of the surface layer or of the underlying material within a series. The Plott series is an example of the coarse-loamy, mixed, mesic Typic Haplumbrepts.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The location of the typical pedon is described, and coordinates are identified by the State plane grid system. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" *(12)*. Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" *(11)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Arkaqua Series

The Arkaqua series consists of very deep, somewhat poorly drained, moderately permeable soils. These soils formed in recent alluvium on flood plains along the major streams. Elevation ranges from about 1,900 to 2,500 feet. Slopes range from 0 to 2 percent. The soils are fine-loamy, mixed, mesic Fluvaquentic Dystrochrepts.

Arkaqua soils are associated with Biltmore, Rosman, and Toxaway soils. Biltmore soils are sandy and well drained. Rosman soils are coarse-loamy and well drained. Toxaway soils are poorly drained or very poorly drained. Biltmore soils are on natural levees along the stream channels. Rosman soils are in slightly elevated areas near the stream channels. Toxaway soils are in depressions farther from the stream channels.

Typical pedon of Arkaqua loam, 0 to 2 percent slopes, frequently flooded; about 6.0 miles south of Franklin on U.S. Highway 441, about 0.4 mile east on Secondary Road 1644, about 600 feet north of the road, in a corn field (State plane coordinates 517,400 feet N., 689,900 feet E.):

Ap—0 to 10 inches; dark brown (10YR 3/3) loam; moderate fine and medium granular structure; very friable; few fine flakes of mica; moderately acid; abrupt smooth boundary.

Bw1—10 to 22 inches; dark yellowish brown (10YR 4/4) loam; few fine distinct brownish yellow (10YR 6/8) mottles; weak medium subangular blocky structure; friable; few fine flakes of mica; strongly acid; gradual wavy boundary.

Bw2—22 to 29 inches; mottled brownish yellow (10YR 6/8) and gray (10YR 5/1) loam; weak medium subangular blocky structure; friable; few fine flakes of mica; strongly acid; clear wavy boundary.

Bg—29 to 48 inches; gray (10YR 5/1) clay loam; weak coarse subangular blocky structure; friable; common fine flakes of mica; strongly acid; clear wavy boundary.

Cg—48 to 60 inches; gray (10YR 5/1) loam; massive; friable; many fine flakes of mica; strongly acid.

The thickness of the solum ranges from 37 to 60 inches. The depth to bedrock is more than 60 inches. Generally, reaction ranges from very strongly acid to moderately acid. In limed areas, however, it ranges to neutral in the upper part of the profile. The number of mica flakes ranges from few to many.

The Ap or A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3.

The Bw horizon has hue of 10YR, value of 3 to 6, and chroma of 3 to 8. It has mottles with chroma of 1 or 2 within a depth of 24 inches. It is sandy loam, fine sandy loam, loam, or clay loam.

The Bg horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It is sandy loam, fine sandy loam, loam, or clay loam.

The Cg horizon has hue of 7.5YR to 2.5Y, value of 3 to 6, and chroma of 1 or 2. The C horizon, if it occurs, has hue of 7.5YR to 2.5Y and value and chroma of 3 to 6. It has common or many mottles with chroma of 1 or 2. The Cg and C horizons are sandy loam, fine sandy loam, loam, or clay loam.

Biltmore Series

The Biltmore series consists of very deep, well drained, rapidly permeable soils. These soils formed in recent alluvium on flood plains along the major streams. Elevation ranges from about 1,900 to 2,500 feet. Slopes range from 0 to 3 percent. The soils are mixed, mesic Typic Udipsamments.

Biltmore soils are associated with Arkaqua, Rosman, and Toxaway soils. Arkaqua and Toxaway soils are fine-loamy. Also, Arkaqua soils are somewhat poorly drained. Toxaway soils are poorly drained or very poorly drained. Rosman soils are coarse-loamy. Arkaqua and Toxaway soils are in depressions. Rosman soils are away from the stream channel.

Typical pedon of Biltmore sandy loam, 0 to 3 percent slopes, frequently flooded; about 3.5 miles north of Franklin on North Carolina Highway 28, about 2.0 miles north on Secondary Road 1372 to Porter's farm, 0.75 mile north of a farm house along a bend in a river (State plane coordinates 581,300 feet N., 681,700 feet E.):

Ap—0 to 12 inches; dark yellowish brown (10YR 4/4) sandy loam; weak fine granular structure; very friable; few fine flakes of mica; strongly acid; clear smooth boundary.

C—12 to 60 inches; yellowish brown (10YR 5/8) loamy fine sand; single grained; very friable; few fine flakes of mica; strongly acid.

The sandy sediments are 40 inches or more thick. Reaction ranges from strongly acid to neutral. The number of mica flakes is few or common. The content of rock fragments is as much as 10 percent to a depth of 40 inches but may be more than 35 percent below a depth of 40 inches. The rock fragments are dominantly gravel in the upper 40 inches and dominantly cobbles below a depth of 40 inches.

The Ap or A horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 1 to 6. Where value is 3 and chroma is 1 to 3, the horizon is less than 10 inches thick.

The C horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 8 within a depth of 40 inches. It has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 1 to 6 below a depth of 40 inches. It is dominantly sand, loamy sand, or loamy fine sand. In some pedons, however, it has thin strata of sandy loam, loam, or silt loam. The total thickness of the strata is less than 6 inches within a depth of 40 inches. In some pedons the part of the C horizon below a depth of 40 inches consists of cobbles and gravel stratified with sandy and loamy sediments.

Braddock Series

The Braddock series consists of very deep, well drained, moderately permeable soils. These soils formed in old alluvium on high stream terraces. Elevation ranges from about 1,900 to 2,500 feet. Slopes range from 2 to 30 percent. The soils are clayey, mixed, mesic Typic Hapludults.

Braddock soils are associated with Dillsboro, Hayesville, and Saunook soils. Dillsboro soils have a browner subsoil than that of the Braddock soils. Hayesville soils formed in residuum and have a C horizon of saprolite. Saunook soils are fine-loamy. Dillsboro soils are in depressions. Hayesville soils are in areas where the landscape breaks sharply. Saunook soils are in drainageways.

Typical pedon of Braddock clay loam, 8 to 15 percent slopes, eroded; about 1.0 mile west of the intersection of U.S. Highways 441 and 64 on U.S. Highway 64, about 1.1 miles south on Secondary Road 1153 to Secondary Road 1148, about 600 feet north of the intersection, in a hay field (State plane coordinates 539,100 feet N., 680,600 feet E.):

Ap—0 to 11 inches; reddish brown (5YR 4/4) clay loam; weak medium granular structure; friable; many fine roots; few fine flakes of mica; about 10 percent gravel; moderately acid; clear smooth boundary.

Bt1—11 to 21 inches; red (2.5YR 4/8) clay; moderate fine and medium subangular blocky structure; firm; common distinct clay films on faces of peds; sticky and slightly plastic; few fine roots; few fine flakes of mica; moderately acid; gradual wavy boundary.

Bt2—21 to 31 inches; red (2.5YR 4/6) clay; moderate fine subangular blocky structure; friable; common distinct clay films on faces of peds; slightly sticky and slightly plastic; few fine flakes of mica; very strongly acid; gradual wavy boundary.

Bt3—31 to 43 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; friable; few distinct clay films on faces of peds; slightly sticky and slightly plastic; few manganese stains; few fine flakes of mica; very strongly acid; gradual wavy boundary.

BC—43 to 57 inches; red (2.5YR 4/8) clay loam; common medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; common manganese stains; common fine flakes of mica; very strongly acid; gradual wavy boundary.

C—57 to 60 inches; multicolored loam; massive; very friable; common fine flakes of mica; very strongly acid.

The thickness of the solum ranges from 40 to more than 60 inches. Generally, reaction is very strongly acid or strongly acid, except where the surface layer has been limed. In some pedons that have been limed in the past, however, the A horizon and the upper part of the Bt horizon range from moderately acid to neutral. The number of mica flakes is few or common. The content of water-rounded gravel and cobbles ranges from 0 to 35 percent in the A and B horizons and is as much as 60 percent in the C horizon. The rock fragments are dominantly cobbles. Some of the fragments, however, are gravel or stones.

The Ap or A horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6.

The Bt horizon dominantly has hue of 10R or 2.5YR, value of 3 to 5, and chroma of 6 to 8. In some pedons, however, it has subhorizons with hue of 5YR. The number of mottles in the shades of yellow or brown ranges from none to common. The texture is clay loam or clay in the fine-earth fraction.

The BC horizon has hue of 10R or 2.5YR, value of 3 to 5, and chroma of 6 to 8. In many pedons it is mottled or streaked in shades of red, yellow, or brown. It is sandy clay loam, clay loam, or loam in the fine-earth fraction.

The C horizon has hue of 10R or 2.5YR, value of 3 to 5, and chroma of 6 to 8 or is multicolored. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

Brasstown Series

The Brasstown series consists of deep, well drained, moderately permeable soils. These soils formed in material weathered from metasedimentary rock, such as phyllite, slate, and metasandstone. They are on low mountains. Elevation ranges from about 1,900 to 3,500 feet. Slopes range from 8 to 95 percent. The soils are fine-loamy, mixed, mesic Typic Hapludults.

Brasstown soils are associated with Junaluska, Santeetlah, and Spivey soils. Junaluska soils are moderately deep. Santeetlah and Spivey soils formed in colluvium and have an umbric epipedon. Also, Spivey soils are loamy-skeletal. Junaluska soils are on the

upper part of side slopes and in areas where the landscape breaks sharply. Santeetlah and Spivey soils are in coves, in drainageways, and on toe slopes.

Typical pedon of Brasstown loam, in an area of Brasstown-Junaluska complex, 30 to 50 percent slopes; along the Little Tennessee River; north of Franklin on North Carolina Highway 28 to Secondary Road 1370, west on Secondary Road 1370 to Secondary Road 1364, north on Secondary Road 1364 to Secondary Road 1363, north 1.1 miles on Secondary Road 1363, about 50 feet west of the road (State plane coordinates 591,800 feet N., 659,300 feet E.):

Oi—1 inch to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A—0 to 6 inches; reddish brown (5YR 4/4) loam; moderate fine and medium granular structure; friable; common fine to coarse roots; about 10 percent channers; few fine flakes of mica; strongly acid; clear smooth boundary.

BA—6 to 12 inches; red (2.5YR 4/6) loam; weak fine and medium subangular blocky structure; friable; common fine to coarse roots; about 10 percent channers; few fine flakes of mica; strongly acid; gradual wavy boundary.

Bt—12 to 36 inches; red (2.5YR 4/8) clay loam; moderate fine and medium subangular blocky structure; friable; few faint clay films on faces of peds; common medium and coarse roots; about 5 percent channers; few fine flakes of mica; strongly acid; gradual wavy boundary.

BC—36 to 45 inches; red (2.5YR 4/8) loam; weak fine and medium subangular blocky structure; friable; few medium and coarse roots; about 15 percent channers; common fine flakes of mica; strongly acid; clear wavy boundary.

Cr—45 to 60 inches; multicolored, weathered, highly fractured metasandstone; partially consolidated but can be dug with difficulty with a spade; few thin seams of red (2.5YR 4/8) fine sandy loam in cracks between rocks.

The thickness of the solum ranges from 30 to 59 inches. The depth to weathered bedrock ranges from 40 to 60 inches. Reaction ranges from extremely acid to moderately acid. The number of mica flakes is few or common. The content of rock fragments ranges from 5 to 35 percent. The rock fragments are dominantly channers.

The A horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 3 to 6.

The BA horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam, fine sandy loam, loam, silt loam, or sandy clay loam in the fine-earth fraction.

The Bt horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8. At least part of the horizon has hue of 2.5YR or 5YR. The texture is loam, sandy clay loam, or clay loam in the fine-earth fraction.

The BC horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam, fine sandy loam, loam, silt loam, or sandy clay loam in the fine-earth fraction.

The C horizon, if it occurs, is multicolored or has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. In the fine-earth fraction, it is fine sandy loam, loam, or silt loam that weathered from saprolite.

The Cr horizon is multicolored, weathered, partially consolidated metasedimentary bedrock, such as phyllite, slate, and metasandstone. It can be dug with difficulty with a spade.

Burton Series

The Burton series consists of moderately deep, well drained, moderately rapidly permeable soils. These soils formed in material weathered from high-grade, metamorphic and igneous, felsic to mafic crystalline rocks, such as mica gneiss, hornblende gneiss, and granite. They are on high mountains. Elevation is generally more than 4,800 feet. Slopes range from 8 to 50 percent. The soils are coarse-loamy, mixed, frigid Typic Haplumbrepts.

Burton soils are associated with Craggey, Cullasaja, and Wayah soils. Craggey soils are shallow. Cullasaja soils are mesic, are loamy-skeletal, and formed in colluvium. Wayah soils are very deep. Craggey soils are near small areas of rock outcrop. Cullasaja soils are at the head of drainageways and on toe slopes. Wayah soils are in saddles and in the less sloping areas.

Typical pedon of Burton sandy loam, in an area of Burton-Craggey-Rock outcrop complex, windswept, 15 to 30 percent slopes, stony; from the parking lot at the end of U.S. Forest Service Road 69 to the Wayah Bald tower, 100 feet north of the tower on the Appalachian Trail on Wayah Bald, 20 feet east of the trail (State plane coordinates 550,900 feet N., 637,100 feet E.):

Oi—2 inches to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A1—0 to 7 inches; black (10YR 2/1) sandy loam; weak fine and medium granular structure; very friable; many fine to coarse roots; about 5 percent gravel and 5 percent cobbles; few fine flakes of mica; very strongly acid; clear smooth boundary.

A2—7 to 13 inches; very dark brown (10YR 2/2) sandy loam; moderate fine and medium granular structure; very friable; common fine and few medium and coarse roots; about 5 percent gravel and 5 percent

cobbles; few fine flakes of mica; strongly acid; clear smooth boundary.

AB—13 to 18 inches; very dark grayish brown (10YR 3/2) sandy loam; moderate medium granular structure; very friable; common fine and few medium and coarse roots; about 5 percent gravel and 10 percent cobbles; few fine flakes of mica; strongly acid; gradual wavy boundary.

Bw—18 to 24 inches; dark yellowish brown (10YR 4/4) cobbly sandy loam; weak fine and medium subangular blocky structure; very friable; few medium and coarse roots; about 5 percent gravel, 10 percent cobbles, and 5 percent stones; common fine flakes of mica; strongly acid; gradual wavy boundary.

C—24 to 36 inches; yellowish brown (10YR 5/6) cobbly sandy loam that weathered from saprolite; massive; very friable; few medium and coarse roots; about 5 percent gravel, 15 percent cobbles, and 5 percent stones; common fine and medium flakes of mica; moderately acid; clear irregular boundary.

R—36 inches; hard mica gneiss bedrock.

The thickness of the solum ranges from 15 to 39 inches. The depth to hard bedrock ranges from 20 to 40 inches. Reaction ranges from extremely acid to moderately acid. The number of mica flakes is few or common. The content of rock fragments is as much as 35 percent. The rock fragments are dominantly cobbles. Some of the fragments, however, are gravel or stones.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3.

The AB horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. It is loam, fine sandy loam, or sandy loam in the fine-earth fraction.

The Bw horizon has hue of 7.5YR or 10YR, value of 3 to 6, and chroma of 4 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The C horizon is saprolite. It has hue of 7.5YR or 10YR, value of 3 to 6, and chroma of 4 to 8 or is multicolored. It is loamy sand or sandy loam in the fine-earth fraction.

Some pedons have a thin Cr horizon, which is multicolored, weathered, partially consolidated bedrock.

The R layer is hard, high-grade, metamorphic or igneous, felsic to mafic crystalline bedrock, such as mica gneiss, hornblende gneiss, and granite.

Cashiers Series

The Cashiers series consists of very deep, well drained, moderately rapidly permeable soils. These soils formed in material weathered from high-grade, metamorphic, mica-rich rocks, such as mica gneiss and mica schist. They are on low and intermediate mountains. Elevation ranges from about 2,000 to 4,800 feet. Slopes range from 30 to 95 percent. The soils are coarse-loamy, micaceous, mesic Umbric Dystrochrepts.

Cashiers soils are associated with Chandler, Fannin, Cullasaja, and Tuckasegee soils. Chandler and Fannin soils have an ochric epipedon. Also, Fannin soils have an argillic horizon. Cullasaja and Tuckasegee soils formed in colluvium and contain less mica than the Cashiers soils. Also, Cullasaja soils are loamy-skeletal. Chandler and Fannin soils are on south- to west-facing slopes. Cullasaja and Tuckasegee soils are in coves, in drainageways, and on toe slopes.

Typical pedon of Cashiers gravelly fine sandy loam, 30 to 50 percent slopes; south of Highland on Secondary Road 1603 to U.S. Forest Service Road 441, south on U.S. Forest Service Road 441 to U.S. Forest Service Road 4563, west on U.S. Forest Service 4563 to the end of the road on Chestnut Mountain, about 600 feet north of the road, in a wooded area (State plane coordinates 493,100 feet N., 756,200 feet E.):

Oi—3 inches to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A—0 to 8 inches; dark brown (10YR 3/3) gravelly fine sandy loam; moderate fine and medium granular structure; very friable; many fine to coarse roots; about 10 percent gravel and 5 percent cobbles; common fine flakes of mica; strongly acid; clear smooth boundary.

Bw—8 to 31 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine and medium subangular blocky structure; very friable; common medium and coarse roots; about 5 percent gravel and 5 percent cobbles; many fine and medium flakes of mica; very strongly acid; gradual wavy boundary.

BC—31 to 49 inches; brownish yellow (10YR 6/8) fine sandy loam; weak fine and medium subangular blocky structure; very friable; common medium and coarse roots; about 5 percent gravel and 5 percent cobbles; many fine and medium flakes of mica; few pockets and streaks of multicolored saprolite; very strongly acid; gradual wavy boundary.

C—49 to 60 inches; multicolored sandy loam that weathered from saprolite; massive; very friable; few coarse roots; about 5 percent gravel and 5 percent cobbles; many medium and coarse flakes of mica; very strongly acid.

The thickness of the solum ranges from 30 to 60 inches. The depth to bedrock is more than 60 inches. Reaction ranges from very strongly acid to moderately acid. The number of mica flakes is common or many in the A horizon and many in the lower horizons. The content of rock fragments ranges from 0 to 35 percent.

The rock fragments are dominantly gravel. Some of the fragments, however, are cobbles or stones.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 to 3.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The BC horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction. It typically has few or common pockets or streaks of saprolite.

The C horizon is multicolored saprolite that weathered from mica-rich rocks, such as mica gneiss and mica schist. It is loamy sand, sandy loam, or fine sandy loam in the fine-earth fraction.

Cataska Series

The Cataska series consists of shallow, excessively drained, moderately rapidly permeable soils. These soils formed in material weathered from metasedimentary rock, such as slate, phyllite, and metasandstone. They are on low and intermediate mountains. Elevation ranges from about 2,000 to 4,800 feet. Slopes range from 30 to 95 percent. The soils are loamy-skeletal, mixed, mesic, shallow Typic Dystrochrepts.

Cataska soils are associated with Santeetlah, Spivey, and Sylco soils. Santeetlah and Spivey soils have an umbric epipedon, are very deep, and formed in colluvium. Sylco soils are moderately deep. Santeetlah and Spivey soils are in drainageways. Sylco soils are intermingled with areas of the Cataska soils.

Typical pedon of Cataska very channery loam, in an area of Cataska-Sylco complex, 50 to 95 percent slopes; northeast about 1.1 miles on U.S. Highway 19 from the Nantahala Power Plant in the Nantahala Gorge, southeast 2.1 miles on Secondary Road 1412, about 50 feet east of the road (State plane coordinates 590,800 feet N., 600,300 feet E.):

Oi—2 inches to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A—0 to 6 inches; dark brown (10YR 3/3) very channery loam; moderate fine granular structure; very friable; many fine to coarse roots; about 30 percent channers and 15 percent flagstones; very strongly acid; gradual wavy boundary.

Bw—6 to 16 inches; dark yellowish brown (10YR 4/4) very channery loam; weak fine subangular blocky structure; very friable; common fine to coarse roots; about 25 percent channers and 20 percent flagstones; strongly acid; gradual irregular boundary.

Cr—16 to 30 inches; multicolored, weathered, fractured slate; partially consolidated but can be dug with difficulty with a spade; few thin seams of dark yellowish brown (10YR 3/4) loam in fractures.

R—30 inches; hard, fractured slate.

The thickness of the solum ranges from 12 to 19 inches. The depth to weathered bedrock ranges from 12 to 20 inches. The depth to hard bedrock ranges from 20 to 40 inches. Reaction ranges from extremely acid to strongly acid. The content of rock fragments ranges from 35 to 60 percent. The rock fragments are dominantly channers and flagstones.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4. Where value is 3 and chroma is 2 or 3, the horizon is less than 7 inches thick.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is loam or silt loam in the fine-earth fraction.

The Cr horizon is multicolored, weathered, partially consolidated bedrock. It can be dug with difficulty with a spade.

The R layer is hard metasedimentary bedrock, such as slate, phyllite, and metasandstone.

Chandler Series

The Chandler series consists of very deep, somewhat excessively drained, moderately rapidly permeable soils. These soils formed in material weathered from high-grade, metamorphic, mica-rich rocks, such as mica gneiss and mica schist. They are on low and intermediate mountains. Elevation ranges from about 2,000 to 4,800 feet. Slopes range from 15 to 95 percent. The soils are coarse-loamy, micaceous, mesic Typic Dystrochrepts.

Chandler soils are associated with Cashiers, Cullasaja, Fannin, and Tuckasegee soils. Cashiers soils have a thicker dark epipedon than that of the Chandler soils. Cullasaja and Tuckasegee soils have an umbric epipedon. Also, Cullasaja soils are loamy-skeletal. Fannin soils have an argillic horizon. Cashiers soils are on north- to east-facing slopes. Cullasaja and Tuckasegee soils formed in colluvium. They are in coves, in drainageways, and on toe slopes. Fannin soils are on south- to west-facing slopes.

Typical pedon of Chandler gravelly fine sandy loam, 30 to 50 percent slopes; south of Highlands on North Carolina Highway 28 to Secondary Road 1618, west on Secondary Road 1618 to U.S. Forest Service Road 79, west on U.S. Forest Service Road 79 to Brown Gap, north 0.7 mile on U.S. Forest Service Road 367 to Gnat Ridge, 100 feet east in a wooded area (State plane coordinates 487,700 feet N., 734,100 feet E.):

Oi—2 inches to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A—0 to 5 inches; dark brown (10YR 3/3) gravelly fine sandy loam; weak medium granular structure; very friable; many fine to coarse roots; about 15 percent gravel and 5 percent cobbles; many fine and medium flakes of mica; strongly acid; clear wavy boundary.

Bw1—5 to 17 inches; yellowish brown (10YR 5/8) loam; moderate medium subangular blocky structure; very friable; common medium and coarse roots; about 10 percent gravel; many fine and medium flakes of mica; strongly acid; gradual wavy boundary.

Bw2—17 to 29 inches; brownish yellow (10YR 6/8) sandy loam; weak medium subangular blocky structure; very friable; few medium and coarse roots; about 5 percent gravel and 5 percent cobbles; many fine and medium flakes of mica; strongly acid; gradual wavy boundary.

C1—29 to 41 inches; brownish yellow (10YR 6/8) sandy loam that weathered from saprolite; massive; very friable; about 5 percent gravel and 5 percent cobbles; many medium flakes of mica; moderately acid; gradual wavy boundary.

C2—41 to 60 inches; multicolored sandy loam that weathered from saprolite; massive; very friable; about 5 percent gravel and 5 percent cobbles; many medium flakes of mica; moderately acid.

The thickness of the solum ranges from 20 to 40 inches. The depth to bedrock is more than 72 inches. Reaction ranges from very strongly acid to moderately acid. The number of mica flakes is common or many in the A horizon and many in the lower horizons. The content of rock fragments ranges from 0 to 35 percent. The rock fragments are dominantly gravel. Some of the fragments, however, are cobbles or stones.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. Where value is 3 and chroma is 2 or 3, the horizon is less than 7 inches thick.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The C horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8 or is multicolored. It is saprolite that weathered from mica-rich rocks, such as mica gneiss and mica schist. It is sandy loam or fine sandy loam in the fine-earth fraction.

Cheoah Series

The Cheoah series consists of deep, well drained, moderately rapidly permeable soils. These soils formed in material weathered from metasedimentary rocks, such as phyllite, slate, and metasandstone. They are on low and intermediate mountains. Elevation ranges from about 2,000 to 4,800 feet. Slopes range from 30 to 95 percent. The soils are coarse-loamy, mixed, mesic Typic Haplumbrepts.

Cheoah soils are associated with Santeetlah, Soco, Spivey, and Stecoah soils. Santeetlah soils formed in colluvium and are very deep. Soco and Stecoah soils have an ochric epipedon. Also, Soco soils are moderately deep. Spivey soils are loamy-skeletal. Santeetlah and Spivey soils are in coves, in drainageways, and on toe slopes. Soco and Stecoah soils are on south- to west-facing slopes.

Typical pedon Cheoah channery loam, 50 to 95 percent slopes; near Junaluska Gap; west of Franklin on U.S. Highway 64 to Secondary Road 1310, west on Secondary Road 1310 to Secondary Road 1400, west on Secondary Road 1400 to Secondary Road 1401, west on Secondary Road 1401 to U.S. Forest Service Road 7270, about 400 feet southeast on U.S. Forest Service 7270, south of the road 400 feet, in a wooded area (State plane coordinates 565,500 feet N., 601,500 feet E.):

Oi—3 inches to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A1—0 to 3 inches; very dark brown (10YR 2/2) channery loam; moderate fine and medium granular structure; very friable; many fine to coarse roots; about 10 percent channers and 5 percent flagstones; few fine flakes of mica; very strongly acid; clear smooth boundary.

A2—3 to 12 inches; dark brown (10YR 3/3) channery fine sandy loam; moderate fine and medium granular structure; very friable; common fine to coarse roots; about 10 percent channers and 5 percent flagstones; few fine flakes of mica; strongly acid; clear smooth boundary.

AB—12 to 17 inches; dark yellowish brown (10YR 4/4) channery fine sandy loam; moderate medium granular structure; very friable; common medium and coarse roots; about 10 percent channers and 5 percent flagstones; few fine flakes of mica; strongly acid; clear smooth boundary.

Bw—17 to 36 inches; yellowish brown (10YR 5/4) fine sandy loam; weak medium subangular blocky structure; friable; few medium and coarse roots; about 10 percent channers; few fine flakes of mica; strongly acid; gradual wavy boundary.

BC—36 to 47 inches; yellowish brown (10YR 5/6) channery fine sandy loam; weak medium subangular blocky structure; friable; few medium roots; about 20 percent channers and 10 percent flagstones; few fine flakes of mica; strongly acid; gradual wavy boundary.

Cr—47 to 60 inches; multicolored, weathered, interbedded metasandstone and phyllite; partially consolidated but can be dug with difficulty with a spade; few thin seams of yellowish brown (10YR 5/8) fine sandy loam in fractures.

The thickness of the solum ranges from 30 to 59 inches. The depth to weathered bedrock ranges from 40 to 60 inches. Reaction ranges from extremely acid to strongly acid in the A horizon and from extremely acid to moderately acid in the lower horizons. The number of mica flakes is few or common. The content of rock fragments ranges from 5 to 35 percent. The rock fragments are dominantly channers and flagstones.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 to 3. The AB horizon, if it occurs, has hue of 10YR and value and chroma of 3 or 4.

The Bw and BC horizons have hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 8. They are fine sandy loam or loam in the fine-earth fraction. Typically, the BC horizon contains more rock fragments than the Bw horizon.

The C horizon, if it occurs, is multicolored saprolite. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The Cr horizon is multicolored, weathered, partially consolidated metasedimentary bedrock, such as metasandstone, phyllite, and slate. It can be dug with difficulty with a spade.

Chestnut Series

The Chestnut series consists of moderately deep, well drained, moderately rapidly permeable soils. These soils formed in material weathered from high-grade, metamorphic or igneous, felsic to mafic crystalline rocks, such as mica gneiss, hornblende gneiss, and granite. They are on intermediate mountains. Elevation ranges from about 3,500 to 4,800 feet. Slopes range from 2 to 95 percent. The soils are coarse-loamy, mixed, mesic Typic Dystrochrepts.

Chestnut soils are associated with Cullasaja, Edneyville, Plott, and Tuckasegee soils. Cullasaja, Edneyville, Plott, and Tuckasegee soils are very deep. Also, Cullasaja, Plott, and Tuckasegee soils have an umbric epipedon. Cullasaja soils are loamy-skeletal. Cullasaja and Tuckasegee soils formed in colluvium. They are in coves, in drainageways, and on toe slopes. Edneyville soils are on the lower part of side slopes and in areas where the landscape breaks less sharply. Plott soils are on north- to east-facing slopes.

Typical pedon of Chestnut gravelly fine sandy loam, in an area of Edneyville-Chestnut complex, 30 to 50 percent slopes, stony; at Winding Stair Gap; west of Franklin on U.S. Highway 64 to truck pullout at the top of Winding Stair Gap, south 0.1 mile on the Appalachian Trail, about 50 feet southeast of the trail (State plane coordinates 529,200 feet N., 640,700 feet E.):

Oi—2 inches to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A—0 to 5 inches; dark brown (10YR 3/3) gravelly fine sandy loam; moderate fine and medium granular structure; very friable; many fine to coarse roots; about 10 percent gravel and 5 percent cobbles; few fine flakes of mica; moderately acid; clear wavy boundary.

AB—5 to 10 inches; dark yellowish brown (10YR 4/4) gravelly fine sandy loam; moderate medium granular structure; very friable; many fine to coarse roots; about 10 percent gravel and 5 percent cobbles; few fine flakes of mica; strongly acid; clear wavy boundary.

Bw—10 to 24 inches; dark yellowish brown (10YR 4/6) gravelly fine sandy loam; weak medium subangular blocky structure; very friable; common medium and coarse roots; about 15 percent gravel and 5 percent cobbles; common fine flakes of mica; strongly acid; gradual wavy boundary.

C—24 to 36 inches; multicolored cobbly fine sandy loam that weathered from saprolite; massive; very friable; few medium and coarse roots; about 15 percent gravel and 15 percent cobbles; common fine flakes of mica; very strongly acid; gradual irregular boundary.

Cr—36 to 45 inches; multicolored, weathered, fractured gneiss; partially consolidated but can be dug with difficulty with a spade; few thin seams of yellowish brown (10YR 5/4) sandy loam in fractures.

The thickness of the solum ranges from 15 to 39 inches. The depth to weathered bedrock ranges from 20 to 40 inches. The depth to hard bedrock is more than 40 inches. Reaction ranges from very strongly acid to moderately acid. The number of mica flakes is few or common. The content of rock fragments ranges from 5 to 35 percent. The rock fragments are dominantly gravel and cobbles. Some of the fragments, however, are stones.

The A horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4. Where value is 3 and chroma is 2 or 3, the horizon is less than 7 inches thick.

The AB horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4. Where value is 3 and chroma is 2 or 3, the horizon is less than 7 inches thick. The texture is loam, fine sandy loam, or sandy loam in the fine-earth fraction.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam, fine

sandy loam, or loam in the fine-earth fraction.

The C horizon is multicolored saprolite. It is loamy sand, sandy loam, or fine sandy loam in the fine-earth fraction.

The Cr horizon is multicolored, weathered, high-grade, metamorphic or igneous, felsic to mafic crystalline bedrock, such as mica gneiss, hornblende gneiss, and granite. It is partially consolidated but can be dug with difficulty with a spade.

The R layer, if it occurs, is hard bedrock, such as mica gneiss, hornblende gneiss, and granite.

Cleveland Series

The Cleveland series consists of shallow, somewhat excessively drained, moderately rapidly permeable soils. These soils formed in material weathered from high-grade, metamorphic or igneous, felsic to mafic crystalline rocks, such as mica gneiss, hornblende gneiss, and granite. They are on intermediate mountains. Elevation ranges from about 3,500 to 4,800 feet. Slopes range from 15 to 95 percent. The soils are loamy, mixed, mesic Lithic Dystrochrepts.

Cleveland soils are associated with Chestnut, Cullasaja, and Plott soils. Chestnut soils are moderately deep. Cullasaja and Plott soils have an umbric epipedon. Also, Cullasaja soils are loamy-skeletal. Chestnut soils are on the lower part of side slopes and in areas where the landscape breaks less sharply. Cullasaja soils are in coves, in drainageways, and on toe slopes. Plott soils are on north- to east-facing slopes.

Typical pedon of Cleveland sandy loam, in an area of Cleveland-Chestnut-Rock outcrop complex, windswept, 15 to 30 percent slopes; on Whiteside Mountain; east of Highlands on U.S. Highway 64 to Secondary Road 1600, south on Secondary Road 1600 to the U.S. Forest Service parking lot at Whiteside Mountain, about 600 feet south on a trail to Whiteside Mountain, 40 feet east of the trail (State plane coordinates 509,400 feet N., 760,800 feet E.):

Oi—2 inches to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A—0 to 5 inches; black (10YR 2/1) sandy loam; weak fine and medium granular structure; very friable; many fine to coarse roots; about 5 percent gravel and 5 percent cobbles; few fine flakes of mica; moderately acid; clear wavy boundary.

Bw1—5 to 9 inches; dark yellowish brown (10YR 4/6) loam; weak medium subangular blocky structure; very friable; common medium and coarse roots; about 10 percent gravel and 5 percent cobbles; few fine flakes of mica; strongly acid; clear wavy boundary.

Bw2—9 to 17 inches; yellowish brown (10YR 5/8) loam; weak medium subangular blocky structure; very friable; common medium and coarse roots; about 10 percent gravel and 5 percent cobbles; few fine flakes of mica; strongly acid; abrupt wavy boundary.

R—17 inches; hard granite bedrock.

The thickness of the solum ranges from 10 to 19 inches. The depth to hard bedrock ranges from 10 to 20 inches. Reaction ranges from very strongly acid to moderately acid. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 35 percent. The rock fragments are dominantly gravel and cobbles.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 to 4. Where value is 2 or 3 and chroma is 1 to 3, the horizon is less than 7 inches thick.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The Cr horizon, if it occurs, is multicolored, weathered, partially consolidated bedrock. It can be dug with difficulty with a spade.

The R layer is hard, high-grade, metamorphic or igneous, felsic to mafic crystalline bedrock, such as mica gneiss, hornblende gneiss, and granite.

Cowee Series

The Cowee series consists of moderately deep, well drained, moderately permeable soils (fig. 9). These soils formed in material weathered from high-grade, metamorphic or igneous, felsic to mafic crystalline rocks, such as mica gneiss, hornblende gneiss, and granite. They are on low mountains. Elevation ranges from about 2,000 to 3,500 feet. Slopes range from 2 to 95 percent. The soils are fine-loamy, mixed, mesic Typic Hapludults.

Cowee soils are associated with Evard, Saunook, and Trimont soils. Evard, Saunook, and Trimont soils are very deep. Also, Saunook and Trimont soils have a thicker dark epipedon than that of the Cowee soils. Evard soils are on the lower part of side slopes and in areas where the landscape breaks less sharply. Saunook soils formed in colluvium. They are in coves, in drainageways, and on toe slopes. Trimont soils are on north- to east-facing slopes.

Typical pedon of Cowee sandy loam, in an area of Evard-Cowee complex, 50 to 95 percent slopes; along Brown Creek; northeast of Franklin on U.S. Highway 441 to Secondary Road 1500, east on Secondary Road 1500 to U.S. Forest Service Road at Brown Creek, east 0.6 mile on U.S. Forest Service Road, north about 200 feet upslope of the road (State plane coordinates 568,400 feet N., 712,600 feet E.):

Oi—2 inches to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A—0 to 10 inches; brown (7.5YR 4/4) sandy loam; moderate fine and medium granular structure; friable; many fine to coarse roots; about 5 percent gravel and 5 percent cobbles; few fine flakes of mica; strongly acid; clear smooth boundary.

Bt—10 to 27 inches; red (2.5YR 4/8) clay loam; moderate medium subangular blocky structure; firm; few faint clay films on faces of peds; common medium and coarse roots; about 10 percent gravel; few fine flakes of mica; strongly acid; clear wavy boundary.

C—27 to 38 inches; multicolored gravelly sandy loam that weathered from saprolite; massive; friable; few medium and coarse roots; about 10 percent gravel and 5 percent cobbles; common fine flakes of mica; strongly acid; clear wavy boundary.

Cr—38 to 45 inches; multicolored, weathered, fractured gneiss; partially consolidated but can be dug with difficulty with a spade; few thin seams of red (2.5YR 4/8) loamy material in cracks between rocks.

The thickness of the solum ranges from 15 to 39 inches. The depth to weathered bedrock ranges from 20 to 40 inches. The depth to hard bedrock is more than 40 inches. Reaction ranges from very strongly acid to moderately acid. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 35 percent. The rock fragments are dominantly gravel and cobbles.

The A horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 3 to 6. Where value and chroma are 3, the horizon is less than 7 inches thick.

The BA horizon, if it occurs, has hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The Bt horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8. It is loam, sandy clay loam, or clay loam in the fine-earth fraction.

The BC horizon, if it occurs, hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The C horizon, if it occurs, is multicolored saprolite. It is sandy loam or fine sandy loam in the fine-earth fraction.

The Cr horizon is multicolored, weathered, high-grade, metamorphic or igneous, felsic to mafic crystalline bedrock, such as mica gneiss, hornblende gneiss, and granite. It is partially consolidated but can be dug with difficulty with a spade.

The R layer, if it occurs, is hard bedrock, commonly mica gneiss, hornblende gneiss, or granite.

Craggey Series

The Craggey series consists of shallow, somewhat excessively drained, moderately rapidly permeable soils. These soils formed in material weathered from high-grade, metamorphic or igneous, felsic to mafic crystalline rock, such as mica gneiss, hornblende gneiss, and granite. They are on high mountains. Elevation is generally more than 4,800 feet. Slopes range from 15 to 50 percent. The soils are loamy, mixed, frigid Lithic Haplumbrepts.

Craggey soils are associated with Burton, Cullasaja, and Wayah soils. Burton soils are moderately deep. Cullasaja soils are mesic, are loamy-skeletal, and formed in colluvium. Cullasaja and Wayah soils are very deep. Burton soils are in the center of the mapped areas and away from areas of rock outcrop. Cullasaja soils are at the head of drainageways and on toe slopes. Wayah soils are in saddles and in the less sloping areas.

Typical pedon of Craggey cobbly sandy loam, in an area of Burton-Craggey-Rock outcrop complex, windswept, 15 to 30 percent slopes, stony; on Wayah Bald; about 150 feet west of the parking lot at the end of U.S. Forest Service Road 69 (State plane coordinates 549,500 feet N., 636,200 feet E.):

Oi—2 inches to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A1—0 to 8 inches; black (10YR 2/1) cobbly sandy loam; weak fine and medium granular structure; very friable; many fine to coarse roots; about 5 percent gravel, 10 percent cobbles, and 5 percent stones; few fine flakes of mica; very strongly acid; clear smooth boundary.

A2—8 to 11 inches; very dark grayish brown (10YR 3/2) cobbly sandy loam; weak fine and medium granular structure; very friable; common fine and few medium and coarse roots; about 5 percent gravel and 10 percent cobbles; few fine flakes of mica; strongly acid; clear smooth boundary.

Bw—11 to 17 inches; dark yellowish brown (10YR 4/4) cobbly sandy loam; weak fine and medium subangular blocky structure; very friable; few medium and coarse roots; about 5 percent gravel, 10 percent cobbles, and 5 percent stones; few fine flakes of mica; strongly acid; clear wavy boundary.

R—17 inches; hard mica gneiss bedrock.

The thickness of the solum ranges from 10 to 19 inches. The depth to hard bedrock ranges from 10 to 20 inches. Reaction ranges from extremely acid to moderately acid. The number of mica flakes is few or common. The content of rock fragments ranges from 5 to 35 percent. The rock fragments are dominantly

cobbles. Some of the fragments, however, are gravel or stones.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3.

The Bw horizon has hue of 7.5YR or 10YR, value of 3 to 6, and chroma of 4 to 6. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The C horizon, if it occurs, is multicolored saprolite. It is fine sandy loam or sandy loam in the fine-earth fraction.

The R layer is hard, high-grade, metamorphic or igneous, felsic to mafic crystalline bedrock, such as mica gneiss, hornblende gneiss, and granite.

Cullasaja Series

The Cullasaja series consists of very deep, well drained, moderately rapidly permeable soils. These soils are cobbly to extremely bouldery. They formed in colluvium weathered from high-grade, metamorphic or igneous, felsic to mafic crystalline rocks, such as mica gneiss, hornblende gneiss, and granite. They are in coves, in drainageways, and on toe slopes. Elevation ranges from about 3,500 to 5,000 feet. Slopes range from 8 to 95 percent. The soils are loamy-skeletal, mixed, mesic Typic Haplumbrepts.

Cullasaja soils are associated with Chestnut, Edneyville, Plott, Tuckasegee, and Wayah soils. Chestnut, Edneyville, Plott, Tuckasegee, and Wayah soils are coarse-loamy. Also, Chestnut and Edneyville soils have an ochric epipedon. Chestnut soils are moderately deep. Wayah soils are in the frigid temperature regime. Chestnut, Edneyville, and Plott soils are on the adjacent uplands. Tuckasegee soils are intermingled with areas of the Cullasaja soils in coves, in drainageways, and on toe slopes. Wayah soils are on head slopes and ridges at elevations above 4,800 feet.

Typical pedon of Cullasaja cobbly sandy clay loam, in an area of Cullasaja-Tuckasegee complex, 15 to 30 percent slopes, stony; about 3.0 miles west of the Coweeta Hydrologic Station office on Shope Creek Road, upslope about 40 feet from a hairpin curve in the road, about 500 feet east of a weir on Watershed 36 (State plane coordinates 505,700 feet N., 664,600 feet E.):

Oi—2 inches to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A1—0 to 10 inches; very dark grayish brown (10YR 3/2) cobbly sandy clay loam; moderate fine and medium granular structure; very friable; many fine and medium and common coarse roots; about 5 percent gravel, 10 percent cobbles, and 5 percent stones; few fine flakes of mica; very strongly acid; clear wavy boundary.

A2—10 to 17 inches; dark brown (10YR 3/3) cobbly fine sandy loam; moderate fine and medium granular structure; very friable; common fine to coarse roots; about 10 percent gravel, 10 percent cobbles, and 5 percent stones; few fine flakes of mica; very strongly acid; clear wavy boundary.

Bw—17 to 32 inches; strong brown (7.5YR 4/6) cobbly sandy loam; weak fine and medium subangular blocky structure; very friable; common medium and coarse roots; about 10 percent gravel, 20 percent cobbles, and 20 percent stones; few fine flakes of mica; strongly acid; clear wavy boundary.

BC—32 to 65 inches; strong brown (7.5YR 4/6) cobbly loamy sand; weak fine and medium subangular blocky structure; very friable; few medium and coarse roots; about 10 percent gravel, 15 percent cobbles, and 30 percent stones; few fine flakes of mica; moderately acid.

The thickness of the solum ranges from 30 to more than 60 inches. The depth to bedrock is more than 72 inches. Reaction ranges from very strongly acid to moderately acid. The number of mica flakes is few or common. The content of rock fragments ranges from 15 to 60 percent to a depth of 20 inches and is more than 35 percent below a depth of 20 inches.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 to 3.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 8. It is sandy loam, fine sandy loam, loam, or sandy clay loam in the fine-earth fraction.

The BC horizon has hue of 7.5YR or 10YR, value of 3 to 6, and chroma of 4 to 8. It is loamy sand or sandy loam in the fine-earth fraction.

The C horizon, if it occurs, has hue of 7.5YR or 10YR, value of 3 to 6, and chroma of 4 to 8 or is multicolored. It is loamy sand or sandy loam in the fine-earth fraction.

Dellwood Series

The Dellwood series consists of moderately well drained soils that are shallow to strata of sand, gravel, and cobbles and are very deep over bedrock. These soils are moderately rapidly permeable in the surface layer and rapidly or very rapidly permeable in the subsoil and underlying material. They formed in recent alluvium on flood plains along small streams. Elevation ranges from about 1,850 to 3,000 feet. Slopes range from 0 to 5 percent. The soils are sandy-skeletal, mixed, mesic Fluventic Haplumbrepts.

Dellwood soils are associated with Nikwasi and Reddies soils. Nikwasi and Reddies soils are

moderately deep to strata of sand, gravel, and cobbles. Also, Nikwasi soils are poorly drained or very poorly drained. Reddies soils are moderately well drained. Nikwasi soils are in depressions. Reddies soils are in slightly elevated areas.

Typical pedon of Dellwood gravelly fine sandy loam, 0 to 5 percent slopes, frequently flooded; along Jones Creek; west of Franklin on U.S. Highway 64 to Secondary Road 1128, south on Secondary Road 1128 to Secondary Road 1130, south 0.3 mile on Secondary Road 1130, about 250 feet west of the road, in a pasture (State plane coordinates 520,600 feet N., 667,200 feet E.):

A—0 to 12 inches; very dark grayish brown (10YR 3/2) gravelly fine sandy loam; moderate fine and medium granular structure; very friable; many fine and medium roots; about 15 percent gravel and 5 percent cobbles; common fine and medium flakes of mica; slightly acid; clear wavy boundary.

Bw—12 to 16 inches; dark yellowish brown (10YR 4/4) cobbly sandy loam; weak fine and medium granular structure; very friable; few medium roots; about 10 percent gravel and 20 percent cobbles; common fine and medium flakes of mica; moderately acid; gradual wavy boundary.

C—16 to 40 inches; multicolored very cobbly sand; single grained; loose; about 15 percent gravel and 40 percent cobbles; common fine and medium flakes of mica; moderately acid.

The loamy sediments are 8 to 20 inches deep to strata of sand, gravel, cobbles, and stones. The depth to hard bedrock is more than 60 inches. Reaction ranges from very strongly acid to neutral. The number of mica flakes is few or common. The content of rock fragments ranges from 5 to 35 percent in the A and B horizons and is more 35 percent in the C horizon. The content of rock fragments in the control section averages more than 35 percent.

The A horizon has hue of 10YR, value of 3, and chroma of 2 or 3.

The Bw horizon has hue of 7.5YR or 10YR and value and chroma of 4 to 6. It is sandy loam or fine sandy loam in the fine-earth fraction.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 4 to 6 or is multicolored. It is sand, loamy sand, or sandy loam in the fine-earth fraction.

Dillard Series

The Dillard series consists of very deep, moderately well drained, moderately slowly permeable soils. These soils formed in old alluvium on low stream terraces. Elevation ranges from about 1,900 to 2,500 feet. Slopes range from 1 to 5 percent. The soils are fine-loamy, mixed, mesic Aquic Hapludults.

Dillard soils are associated with Hemphill and Statler soils. Hemphill soils are very poorly drained and contain more than 35 percent clay in the argillic horizon. Statler soils are well drained. Hemphill soils are in depressions. Statler soils are in slightly elevated areas.

Typical pedon of Dillard loam, 1 to 5 percent slopes, rarely flooded; about 3.8 miles west of Franklin on U.S. Highway 64 to Mt. Hope Church, about 700 feet west of the church, in a corn field (State plane coordinates 541,700 feet N., 667,400 feet E.):

Ap—0 to 7 inches; dark brown (10YR 3/3) loam; weak fine granular structure; very friable; few fine flakes of mica; moderately acid; clear smooth boundary.

Bt1—7 to 21 inches; yellowish brown (10YR 5/6) clay loam; common fine distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; friable; few faint clay films on faces of peds; few fine flakes of mica; moderately acid; gradual wavy boundary.

Bt2—21 to 36 inches; yellowish brown (10YR 5/6) clay loam; common fine distinct light gray (10YR 7/2) and few fine distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; firm; few faint clay films on faces of peds; few fine flakes of mica; strongly acid; gradual wavy boundary.

Btg—36 to 50 inches; light gray (10YR 6/2) loam; many medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; common fine flakes of mica; strongly acid; gradual wavy boundary.

C—50 to 60 inches; yellowish brown (10YR 5/6) sandy loam; few medium distinct light gray (10YR 6/2) and few medium distinct strong brown (7.5YR 5/6) mottles; massive; very friable; common fine flakes of mica; strongly acid.

The thickness of the solum ranges from 40 to 60 inches. Reaction is strongly acid or moderately acid in the A horizon, except where the surface layer has been limed, and is very strongly acid or strongly acid in B and C horizons. The number of mica flakes is few or common.

The Ap or A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. Where value is 3, the horizon is 10 inches or less thick.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. Mottles with chroma of 2 or less are within the upper 24 inches of the horizon. The texture is sandy clay loam or clay loam.

The Btg horizon has hue of 10YR, value of 5 or 6,

and chroma of 1 or 2. It is sandy clay loam or clay loam.

The C horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is sand, loamy sand, sandy loam, loam, sandy clay loam, or clay loam in the fine-earth fraction.

The Cg horizon, if it occurs, has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It is sandy clay loam or clay loam.

Dillsboro Series

The Dillsboro series consists of very deep, well drained, moderately permeable soils. These soils formed in old alluvium on high stream terraces. Elevation ranges from about 1,900 to 2,500 feet. Slopes range from 2 to 15 percent. The soils are clayey, mixed, mesic Humic Hapludults.

Dillsboro soils are associated with Braddock and Saunook soils. Braddock soils have a lighter colored epipedon than that of the Dillsboro soils and a redder argillic horizon. Saunook soils are fine-loamy and formed in colluvium. Braddock soils are on small knolls. Saunook soils are in drainageways.

Typical pedon of Dillsboro loam, 2 to 8 percent slopes; about 1.0 mile west of the intersection of U.S. Highways 441 and 64 on U.S. Highway 64, about 1.1 miles south on Secondary Road 1153 to Secondary Road 1148, about 500 feet northwest of the intersection, in a hay field (State plane coordinates 539,000 feet N., 680,700 feet E.):

Ap—0 to 12 inches; dark brown (7.5YR 3/4) loam; moderate medium granular structure; friable; many fine roots; few fine flakes of mica; about 10 percent gravel; strongly acid; clear smooth boundary.

Bt1—12 to 26 inches; strong brown (7.5YR 5/6) clay loam; moderate fine and medium subangular blocky structure; friable; few distinct clay films on faces of peds; few fine roots; few fine flakes of mica; moderately acid; gradual wavy boundary.

Bt2—26 to 42 inches; strong brown (7.5YR 5/8) clay; moderate fine and medium subangular blocky structure; firm; common distinct clay films on faces of peds; slightly sticky and slightly plastic; few fine flakes of mica; moderately acid; gradual wavy boundary.

Bt3—42 to 50 inches; strong brown (7.5YR 5/8) clay loam; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; few fine flakes of mica; strongly acid; gradual wavy boundary.

BC—50 to 60 inches; strong brown (7.5YR 5/8) loam; weak medium subangular blocky structure; friable; common fine flakes of mica; very strongly acid.

The thickness of the solum is more than 60 inches. Generally, reaction ranges from very strongly acid to moderately acid. In some pedons that have been limed in the past, however, the A horizon and the upper part of the Bt horizon range from moderately acid to neutral. The number of mica flakes is few or common. The content of water-rounded gravel and cobbles ranges from 0 to 35 percent in the A and B horizons and is as much as 60 percent in the C horizon. The rock fragments are dominantly cobbles. Some of the fragments, however, are gravel or stones.

The Ap or A horizon has hue of 7.5YR or 10YR, value of 3, and chroma of 2 to 4.

The Bt horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8. It is clay loam or clay in the fine-earth fraction.

The BC horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8. It is loam, sandy clay loam, or clay loam in the fine-earth fraction.

The C horizon, if it occurs, has hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8 or is multicolored. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

Edneyville Series

The Edneyville series consists of very deep, well drained, moderately rapidly permeable soils (fig. 10). These soils formed in material weathered from high-grade, metamorphic or igneous, felsic to mafic crystalline rocks, such as mica gneiss, hornblende gneiss, and granite. They are on intermediate mountains. Elevation ranges from about 3,500 to 4,800 feet. Slopes range from 2 to 95 percent. The soils are coarse-loamy, mixed, mesic Typic Dystrochrepts.

Edneyville soils are associated with Chestnut, Cullasaja, Plott, and Tuckasegee soils. Chestnut soils are moderately deep. Cullasaja, Plott, and Tuckasegee soils have an umbric epipedon. Also, Cullasaja soils are loamy-skeletal. Chestnut soils are on the upper part of side slopes and in areas where the landscape breaks sharply. Cullasaja and Tuckasegee soils formed in colluvium. They are in coves, in drainageways, and on toe slopes. Plott soils are on north- to east-facing slopes.

Typical pedon of Edneyville fine sandy loam, in an area of Edneyville-Chestnut complex, 15 to 30 percent slopes, stony; east of Franklin on U.S. Highway 64 to about 0.8 mile beyond the Dry Falls parking area, about 200 feet northeast of the road, on a ridge (State plane coordinates 501,800 feet N., 733,400 feet E.):

Oi—2 inches to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A—0 to 5 inches; dark yellowish brown (10YR 3/4) fine

sandy loam; moderate medium granular structure; very friable; many fine to coarse roots; about 5 percent gravel and 5 percent cobbles; few fine flakes of mica; strongly acid; abrupt smooth boundary.

Bw1—5 to 12 inches; strong brown (7.5YR 5/6) loam; moderate medium subangular blocky structure; very friable; common medium and coarse roots; about 10 percent gravel; few fine flakes of mica; very strongly acid; gradual wavy boundary.

Bw2—12 to 39 inches; strong brown (7.5YR 5/8) fine sandy loam; weak medium subangular blocky structure; very friable; few medium and coarse roots; about 10 percent gravel; few fine flakes of mica; very strongly acid; gradual wavy boundary.

BC—39 to 43 inches; mottled yellowish brown (10YR 5/8), strong brown (7.5YR 5/6), and light yellowish brown (10YR 6/4) fine sandy loam; weak medium subangular blocky structure; very friable; few medium and coarse roots; about 5 percent gravel and 5 percent cobbles; few fine flakes of mica; very strongly acid; gradual wavy boundary.

C1—43 to 51 inches; mottled yellowish brown (10YR 5/6), yellowish red (5YR 5/8), and very pale brown (10YR 8/3) sandy loam that weathered from saprolite; massive; very friable; few medium roots; about 5 percent gravel and 5 percent cobbles; common fine flakes of mica; very strongly acid; gradual wavy boundary.

C2—51 to 64 inches; sandy loam in shades of gray, black, and white that weathered from saprolite; massive; very friable; few medium roots; about 5 percent gravel and 5 percent cobbles; common fine flakes of mica; very strongly acid.

The thickness of the solum ranges from 20 to 55 inches. The depth to bedrock is more than 60 inches. Reaction ranges from very strongly acid to moderately acid, except where the surface layer has been limed. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 35 percent. The rock fragments are dominantly gravel and cobbles. Some of the fragments, however, are stones.

The A horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4. Where value is 3 and chroma is 2 or 3, the horizon is less than 7 inches thick.

The AB horizon, if it occurs, has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4. It is fine sandy loam or sandy loam.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The BC horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8 or is mottled in shades of brown and yellow. It is sandy loam or fine sandy loam in the fine-earth fraction.

The C horizon is saprolite. It has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8 or is multicolored. It is loamy sand, sandy loam, or fine sandy loam in the fine-earth fraction.

Evard Series

The Evard series consists of very deep, well drained, moderately permeable soils (fig. 11). These soils formed in material weathered from high-grade, metamorphic or igneous, felsic to mafic crystalline rock, such as mica gneiss, hornblende gneiss, and granite. They are on low mountains. Elevation ranges from about 2,000 to 3,500 feet. Slopes range from 2 to 95 percent. The soils are fine-loamy, oxidic, mesic Typic Hapludults.

Evard soils are associated with Cowee, Saunook, and Trimont soils. Cowee soils are moderately deep. Saunook and Trimont soils have a thicker dark epipedon than that of the Evard soils. Cowee soils are on the upper part of side slopes and in areas where the landscape breaks sharply. Saunook soils formed in colluvium. They are in coves, in drainageways, and on toe slopes. Trimont soils are on north- to east-facing slopes.

Typical pedon of Evard fine sandy loam, in an area of Evard-Cowee complex, 50 to 95 percent slopes; northeast of Franklin on U.S. Highway 441 to Secondary Road 1500, east on Secondary Road 1500 to U.S. Forest Service Road at Brown Creek, east 0.6 mile on U.S. Forest Service Road, north about 50 feet upslope of the road (State plane coordinates 568,300 feet N., 712,700 feet E.):

Oi—2 inches to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A—0 to 5 inches; brown (7.5YR 4/4) fine sandy loam; moderate fine and medium granular structure; friable; many fine to coarse roots; about 5 percent gravel and 5 percent cobbles; few fine flakes of mica; strongly acid; clear smooth boundary.

BA—5 to 8 inches; strong brown (7.5YR 4/6) loam; moderate fine and medium subangular blocky structure; friable; many fine to coarse roots; about 5 percent gravel and 5 percent cobbles; few fine flakes of mica; strongly acid; clear smooth boundary.

Bt1—8 to 23 inches; yellowish red (5YR 4/6) sandy clay loam; moderate fine and medium subangular blocky structure; friable; few faint clay films on faces of peds; common medium and coarse roots; about 10 percent gravel; few fine flakes of mica; strongly acid; gradual wavy boundary.

Figure 9.—Typical profile of a Cowee sandy loam. Cowee soils are moderately deep over soft, weathered bedrock.

Figure 10.—Typical profile of an Edneyville fine sandy loam. Edneyville soils have widely spaced rock fragments.

Figure 11.—Typical profile of an Evard fine sandy loam.

Figure 12.—Typical profile of a Junaluska channery fine sandy loam. Junaluska soils are moderately deep over soft, weathered bedrock.

Figure 13.—Typical profile of a Plott fine sandy loam. Plott soils have a thick, dark surface layer.

Figure 14.—Typical profile of a Trimont gravelly loam.

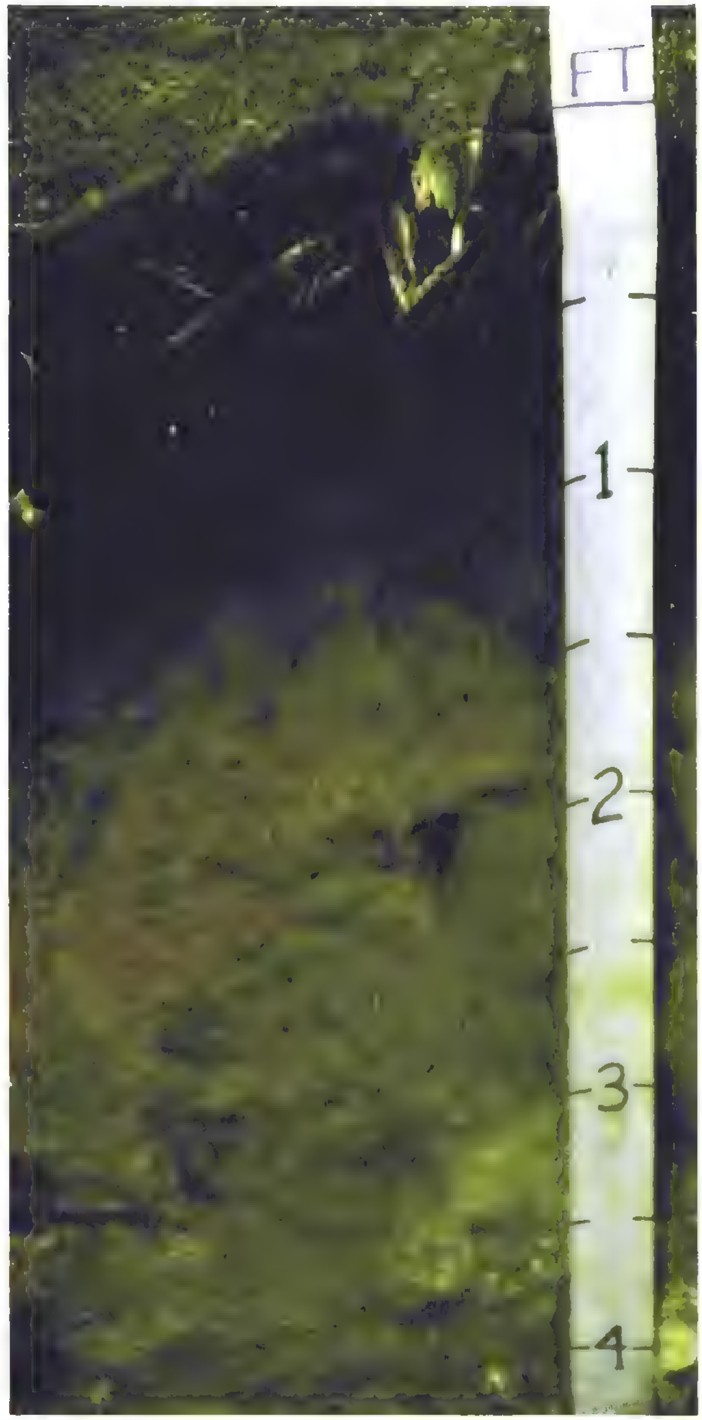

Figure 15.—Typical profile of a Wayah sandy loam. Wayah soils have a dark surface layer that extends to a depth of about 13 inches.

Bt2—23 to 35 inches; red (2.5YR 4/6) sandy clay loam; moderate fine and medium subangular blocky structure; firm; few faint clay films on faces of peds; common medium and coarse roots; about 10 percent gravel; few fine flakes of mica; strongly acid; gradual wavy boundary.

BC—35 to 45 inches; red (2.5YR 4/6) fine sandy loam; weak fine and medium subangular blocky structure; friable; few medium and coarse roots; about 10 percent gravel; common fine flakes of mica; strongly acid; clear wavy boundary.

C—45 to 61 inches; multicolored sandy loam that weathered from saprolite; massive; friable; few coarse roots; about 5 percent gravel and 5 percent cobbles; common fine flakes of mica; strongly acid; gradual irregular boundary.

Cr—61 to 66 inches; multicolored, weathered, fractured mica gneiss; partially consolidated but can be dug with difficulty with a spade; few thin seams of red (2.5YR 4/8) loam in cracks between rocks.

The thickness of the solum ranges from 20 to more than 40 inches. The depth to bedrock is more than 60 inches. Reaction ranges from very strongly acid to moderately acid, except where the surface layer has been limed. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 35 percent in the A and C horizons and from 0 to 15 percent in the B horizon. The rock fragments are dominantly gravel. Some of the fragments, however, are cobbles or stones.

The A horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 3 to 6.

The BA horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 6 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 to 8. It is loam, sandy clay loam, or clay loam in the fine-earth fraction.

The BC horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 6 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The C horizon is multicolored saprolite that weathered from high-grade, metamorphic or igneous, felsic to mafic crystalline rock, such as mica gneiss, hornblende gneiss, and granite. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The Cr horizon is multicolored, partially consolidated, weathered bedrock. It can be dug with difficulty with a spade.

Fannin Series

The Fannin series consists of very deep, well drained, moderately permeable soils. These soils formed in material weathered from high-grade, metamorphic, mica-rich rocks, such as mica gneiss and mica schist. They are on low mountains. Elevation ranges from about 2,000 to 3,500 feet. Slopes range from 8 to 95 percent. The soils are fine-loamy, micaceous, mesic Typic Hapludults.

Fannin soils are associated with Cashiers, Chandler, and Saunook soils. Cashiers and Chandler soils are coarse-loamy. Saunook soils are Humic Hapludults. Cashiers and Chandler soils are on north- to east-facing slopes. Saunook soils are in coves, in drainageways, and on toe slopes.

Typical pedon of Fannin fine sandy loam, 15 to 30 percent slopes; south of Highlands on North Carolina Highway 28 to Secondary Road 1618, west on Secondary Road 1618 to U.S. Forest Service Road 79, west on U.S. Forest Service Road 79 to Brown Gap, about 50 feet north of the intersection of U.S. Forest Service Roads 79 and 77, in a wooded area (State plane coordinates 486,900 feet N., 732,500 feet E.):

Oi—2 inches to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A—0 to 4 inches; brown (7.5YR 4/4) fine sandy loam; weak fine and medium granular structure; friable; many fine to coarse roots; about 5 percent gravel and 5 percent cobbles; common fine and medium flakes of mica; moderately acid; abrupt smooth boundary.

BA—4 to 7 inches; yellowish red (5YR 4/6) fine sandy loam; weak medium subangular blocky structure; very friable; common fine to coarse roots; about 5 percent gravel; common fine and medium flakes of mica; moderately acid; clear wavy boundary.

Bt—7 to 21 inches; red (2.5YR 4/6) sandy clay loam; moderate fine and medium subangular blocky structure; firm; few discontinuous clay films on faces of peds; common medium and coarse roots; about 5 percent gravel; many fine and medium flakes of mica; strongly acid; gradual wavy boundary.

BC—21 to 27 inches; red (2.5YR 5/8) fine sandy loam; weak fine and medium subangular blocky structure; friable; few medium and coarse roots; about 10 percent gravel; many fine and medium flakes of mica; moderately acid; gradual wavy boundary.

C—27 to 60 inches; multicolored sandy loam that weathered from saprolite; massive; friable; few coarse roots; about 5 percent gravel and 5 percent cobbles; many fine and medium flakes of mica; moderately acid.

The thickness of the solum ranges from 20 to 45 inches. The depth to bedrock is more than 72 inches. Reaction ranges from very strongly acid to moderately acid. The number of mica flakes is common or many in

the A horizon and the upper part of the B horizon and is many in the lower part of the B horizon and in the C horizon. The content of rock fragments ranges from 0 to 35 percent in the A and C horizons and from 0 to 25 percent in the B horizon. The rock fragments are dominantly gravel. Some of the fragments, however, are cobbles or stones.

The A horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4.

The BA horizon has hue of 5YR, value of 4 or 5, and chroma of 4 to 6. It is fine sandy loam or loam in the fine-earth fraction.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 to 8. It is loam, sandy clay loam, or clay loam in the fine-earth fraction.

The BC horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The C horizon is multicolored saprolite. It is sandy loam or fine sandy loam in the fine-earth fraction.

Hayesville Series

The Hayesville series consists of very deep, well drained, moderately permeable soils. These soils formed in material weathered from high-grade, metamorphic, felsic crystalline rock, such as mica gneiss. They are on uplands in low rolling hills. Elevation ranges from about 2,000 to 2,500 feet. Slopes range from 2 to 30 percent. The soils are clayey, kaolinitic, mesic Typic Kanhapludults.

Hayesville soils are associated with Braddock, Cowee, Evard, and Saunook soils. Braddock soils formed in old alluvium and do not have a C horizon of saprolite. Cowee, Evard, and Saunook soils are fine-loamy. Braddock soils are on the adjacent high stream terraces. Cowee and Evard soils are in areas where the landscape breaks more abruptly. Saunook soils are in drainageways.

Typical pedon of Hayesville clay loam, 8 to 15 percent slopes, eroded; about 1.5 miles west of the intersection of U.S. Highways 441 and 64 on U.S. Highway 64, about 0.4 mile south on Secondary Road 1148 to Louisa Chapel Church, about 300 feet southeast of the church, in a hay field (State plane coordinates 542,100 feet N., 679,900 feet E.):

Ap—0 to 6 inches; reddish brown (5YR 4/4) clay loam; weak medium granular structure; friable; many fine roots; few fine flakes of mica; about 10 percent gravel; neutral; clear smooth boundary.

Bt1—6 to 18 inches; red (2.5YR 4/8) clay; moderate medium subangular blocky structure; firm; common distinct clay films on faces of peds; sticky and slightly plastic; few medium roots; few fine flakes of mica; neutral; clear wavy boundary.

Bt2—18 to 33 inches; red (2.5YR 4/8) clay loam; moderate medium subangular blocky structure; friable; few distinct clay films on faces of peds; slightly sticky and slightly plastic; few fine flakes of mica; slightly acid; gradual wavy boundary.

BC—33 to 45 inches; red (2.5YR 4/8) loam; weak medium subangular blocky structure; friable; few fine flakes of mica; very strongly acid; gradual wavy boundary.

C—45 to 60 inches; multicolored loam that weathered from saprolite; massive; very friable; common fine flakes of mica; very strongly acid.

The thickness of the solum ranges from 30 to 60 inches. The depth to bedrock is more than 60 inches. Generally, reaction ranges from extremely acid to moderately acid, except where the surface layer has been limed. In some pedons that have been limed in the past, however, the A horizon and the upper part of the Bt horizon range to neutral. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 15 percent. The rock fragments are dominantly gravel. Some of the fragments, however, are cobbles.

The A horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 to 8. It is clay loam or clay in the fine-earth fraction.

The BC horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 to 8. It is loam, sandy clay loam, or clay loam in the fine-earth fraction.

The C horizon is multicolored saprolite that weathered from high-grade, metamorphic, felsic crystalline rock, such as mica gneiss. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

Hemphill Series

The Hemphill series consists of very deep, very poorly drained, slowly permeable soils. These soils formed in old alluvium on low stream terraces. Elevation ranges from about 1,900 to 2,500 feet. Slopes range from 0 to 3 percent. The soils are fine, mixed, mesic Typic Umbraqualfs.

Hemphill soils are associated with Dillard and Statler soils. Dillard and Statler soils have an ochric epipedon and are fine-loamy. Also, Dillard soils are moderately well drained. Statler soils are well drained. Dillard and Statler soils are in slightly elevated areas.

Typical pedon of Hemphill loam, 0 to 3 percent slopes, rarely flooded; about 3.2 miles north of Franklin on North Carolina Highway 28, about 2.2 miles west on

Secondary Road 1379, about 0.4 mile southwest on old Secondary Road 1433, about 300 feet east of the road, in a corn field (State plane coordinates 565,100 feet N., 679,400 feet E.):

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) loam; weak fine granular structure; very friable; few fine flakes of mica; moderately acid; clear smooth boundary.

Btg1—8 to 13 inches; dark gray (10YR 4/1) clay loam; moderate medium subangular blocky structure; firm; few faint clay films on faces of peds; few fine flakes of mica; strongly acid; gradual wavy boundary.

Btg2—13 to 32 inches; gray (10YR 5/1) clay loam; common fine distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; few faint clay films on faces of peds; few fine flakes of mica; strongly acid; gradual wavy boundary.

BCg—32 to 60 inches; gray (10YR 5/1) sandy clay loam; few fine distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; firm; few thin lenses of sand in the lower part; common fine flakes of mica; very strongly acid.

The thickness of the solum ranges from 40 to more than 60 inches. Reaction ranges from very strongly acid to neutral. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 15 percent in the A and B horizons and from 0 to 60 percent in the C horizon, if it occurs.

The A horizon has hue of 10YR, value of 3, and chroma of 1 to 3.

The Btg horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2, or it is neutral in hue and has value of 4 to 6. It is clay loam, silty clay loam, or clay in the fine-earth fraction.

The BCg horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2, or it is neutral in hue and has value of 4 to 6. It is loam, sandy clay loam, or clay loam in the fine-earth fraction.

The C horizon, if it occurs, has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2, or it is neutral in hue and has value of 4 to 6. It is old alluvium. It is sand, loamy sand, sandy loam, loam, sandy clay loam, or clay loam in the fine-earth fraction.

Junaluska Series

The Junaluska series consists of moderately deep, well drained, moderately permeable soils (fig. 12). These soils formed in material weathered from metasedimentary rocks, such as phyllite, slate, and metasandstone. They are on low mountains. Elevation ranges from about 1,900 to 3,500 feet. Slopes range from 8 to 95 percent. The soils are fine-loamy, mixed, mesic Typic Hapludults.

Junaluska soils are associated with Brasstown, Santeetlah, and Spivey soils. Brasstown soils are deep. Santeetlah and Spivey soils formed in colluvium. They have an umbric epipedon. Also, Santeetlah soils are coarse-loamy. Spivey soils are loamy-skeletal. Brasstown soils are on the lower part of side slopes and in areas where the landscape breaks less sharply. Santeetlah and Spivey soils are in coves, in drainageways, and on toe slopes.

Typical pedon of Junaluska channery fine sandy loam, in an area of Brasstown-Junaluska complex, 30 to 50 percent slopes; along the Little Tennessee River; north of Franklin on North Carolina Highway 28 to Secondary Road 1370, west on Secondary Road 1370 to Secondary Road 1364, north on Secondary Road 1364 to Secondary Road 1363, north 1.1 miles on Secondary Road 1363, about 150 feet west of the road (State plane coordinates 591,800 feet N., 659,200 feet E.):

Oi—1 inch to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A—0 to 5 inches; yellowish red (5YR 4/6) channery fine sandy loam; moderate medium granular structure; friable; many fine to coarse roots; about 15 percent channers; few fine flakes of mica; strongly acid; clear smooth boundary.

Bt—5 to 21 inches; red (2.5YR 4/6) sandy clay loam; weak fine and medium subangular blocky structure; friable; few faint clay films on faces of peds; common fine and medium roots; about 10 percent channers; few fine flakes of mica; strongly acid; gradual wavy boundary.

C—21 to 36 inches; multicolored flaggy fine sandy loam that weathered from saprolite; massive; very friable; about 10 percent channers and 10 percent flagstones; few fine flakes of mica; strongly acid; gradual wavy boundary.

Cr—36 to 45 inches; multicolored, weathered, highly fractured metasandstone; partially consolidated but can be dug with difficulty with a spade; few thin seams of yellowish red (5YR 5/8) sandy clay loam in cracks between rocks.

The thickness of the solum ranges from 15 to 39 inches. The depth to weathered bedrock ranges from 20 to 40 inches. Reaction ranges from extremely acid to moderately acid. The number of mica flakes is few or common. The content of rock fragments ranges from 5 to 35 percent. The rock fragments are dominantly channers and flagstones.

The A horizon has hue of 7.5YR or 10YR, value of 3

to 5, and chroma of 3 to 8. Where value or chroma is 3, the horizon is less than 6 inches thick.

The BA horizon, if it occurs, has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8. It is fine sandy loam or loam in the fine-earth fraction.

The Bt horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8. At least part of the horizon has hue of 2.5YR or 5YR. The texture is loam or clay loam in the fine-earth fraction.

The BC horizon, if it occurs, has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8. It is fine sandy loam or loam in the fine-earth fraction.

The C horizon is multicolored saprolite that weathered from metasedimentary rock. It is sandy loam or fine sandy loam in the fine-earth fraction.

The Cr horizon is multicolored, weathered metasedimentary bedrock, such as phyllite, slate, and metasandstone. It is partially consolidated but can be dug with difficulty with a spade.

Nikwasi Series

The Nikwasi series consists of poorly drained or very poorly drained soils that are moderately deep to strata of sand, gravel, and cobbles and are very deep over bedrock. These soils are moderately rapidly permeable in the A horizon and rapidly permeable in the C horizon. They formed in recent alluvium on flood plains along small streams. Elevation ranges from about 1,850 to 3,000 feet. Slopes range from 0 to 2 percent. The soils are coarse-loamy over sandy or sandy-skeletal, mixed, nonacid, mesic Cumulic Humaquepts.

Nikwasi soils are associated with Dellwood and Reddies soils. Dellwood and Reddies soils are moderately well drained. Also, Dellwood soils are loamy-skeletal. Reddies soils are in slightly elevated areas. Dellwood soils are along present and old stream channels.

Typical pedon of Nikwasi fine sandy loam, 0 to 2 percent slopes, frequently flooded; north of Franklin on North Carolina Highway 28 to Secondary Road 1340, north on Secondary Road 1340 to Secondary Road 1341, northeast 1.4 miles on Secondary Road 1341, about 300 feet east of the road, in a pasture (State plane coordinates 581,800 feet N., 690,400 feet E.):

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak medium granular structure; very friable; many fine roots; few fine flakes of mica; strongly acid; clear smooth boundary.

A—9 to 17 inches; very dark grayish brown (2.5YR 3/2) loamy sand; weak medium granular structure; very friable; common fine roots; common fine flakes of mica; very strongly acid; abrupt wavy boundary.

AC—17 to 25 inches; very dark gray (10YR 3/1) sand; massive; very friable; few fine roots; common fine flakes of mica; very strongly acid; abrupt wavy boundary.

Cg—25 to 60 inches; dark gray (10YR 4/1) extremely gravelly sand; single grained; loose; about 70 percent waterworn gravel and cobbles; common fine flakes of mica; very strongly acid.

The depth to the sandy C horizon, which contains more than 35 percent gravel or cobbles or both, is 24 to 40 inches. The depth to bedrock is more than 60 inches. Generally, reaction is very strongly acid or strongly acid. In limed areas, however, the Ap horizon is slightly acid to strongly acid. The number of mica flakes ranges from few to many. The content of rock fragments ranges from 0 to 35 percent in the horizons above the skeletal alluvium. The rock fragments are dominantly gravel and cobbles.

The A horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 to 3. The AC horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 to 3. It is loamy sand or loamy fine sand.

The Cg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It is coarse sand, sand, loamy coarse sand, or loamy sand in the fine-earth fraction.

The Nikwasi soils in Macon County are taxadjuncts to the series because they have a loamy Ap or A1 horizon that is less than 10 inches in thickness and are more acid between depths of 10 and 40 inches than is definitive for the series. These differences, however, do not affect the overall use, management, and behavior of these soils.

Oconaluftee Series

The Oconaluftee series consists of very deep, well drained, moderately rapidly permeable soils. These soils formed in material weathered from metasedimentary rocks, such as phyllite, slate, and metasandstone. They are on high mountains. Elevation is generally more than 4,800 feet. Slopes range from 30 to 95 percent. The soils are coarse-loamy, mixed, frigid Typic Haplumbrepts.

Oconaluftee soils are associated with Cataska, Santeetlah, Spivey, and Sylco soils. Cataska, Santeetlah, Spivey, and Sylco soils are at lower elevations than the Oconaluftee soils and are in the mesic temperature regime. Also, Cataska soils are shallow. Sylco soils are moderately deep. Spivey soils are loamy-skeletal. Sylco and Cataska soils are at the edge of small areas of rock outcrop. Santeetlah and Spivey soils formed in colluvium. They are at the head of drainageways and on toe slopes.

Typical pedon of Oconaluftee channery loam,

windswept, 30 to 50 percent slopes; on Tusquitee Bald; west of Franklin on U.S. Highway 64 to Secondary Road 1310, west on Secondary Road 1310 to Secondary Road 1400, west on Secondary Road 1400 to Secondary Road 1401, west on Secondary Road 1401 to Secondary Road 1605 in Cherokee County, west on Secondary Road 1605 to U.S. Forest Service Road 708, southeast on U.S. Forest Service Road 708 to U.S. Forest Service Road 440, west on U.S. Forest Service 440 Road to Old Road Gap, south 2.1 miles on a U.S. Forest Service trail to the junction of Macon, Clay, and Cherokee counties (State plane coordinates 540,900 feet N., 587,500 feet E.):

Oi—2 inches to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A1—0 to 8 inches; black (10YR 2/1) channery loam; weak fine and medium granular structure; very friable; many fine to coarse roots; about 15 percent channers and 5 percent flagstones; few fine flakes of mica; strongly acid; clear smooth boundary.

A2—8 to 12 inches; very dark brown (10YR 2/2) channery loam; weak fine and medium granular structure; very friable; many fine to coarse roots; about 15 percent channers and 5 percent flagstones; few fine flakes of mica; strongly acid; clear smooth boundary.

Bw—12 to 44 inches; dark grayish brown (10YR 4/3) channery loam; weak fine and medium subangular blocky structure; friable; few medium and coarse roots; about 15 percent channers and 5 percent flagstones; few fine flakes of mica; strongly acid; clear wavy boundary.

C—44 to 60 inches; multicolored flaggy fine sandy loam that weathered from saprolite; massive; very friable; about 5 percent channers, 15 percent flagstones, and 10 percent stones; few fine and medium flakes of mica; strongly acid.

The thickness of the solum ranges from 30 to 60 inches. The depth to bedrock is more than 60 inches. Reaction ranges from extremely acid to strongly acid in the A horizon and from extremely acid to moderately acid in the other horizons. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 35 percent. The rock fragments are dominantly channers and flagstones. Some of the fragments, however, are stones.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 to 3.

The Bw horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 to 8. It is fine sandy loam or loam in the fine-earth fraction.

The BC horizon, if it occurs, has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 to 8. It is fine sandy loam or loam in the fine-earth fraction. Typically, the content of rock fragments increases in the BC horizon compared to the overlying horizons.

The C horizon is multicolored saprolite that weathered from metasedimentary rock. It is sandy loam, loam, or fine sandy loam in the fine-earth fraction.

Plott Series

The Plott series consists of very deep, well drained, moderately rapidly permeable soils (fig. 13). These soils formed in material weathered from high-grade, metamorphic or igneous, felsic to mafic crystalline rocks, such as mica gneiss, hornblende gneiss, and granite. They are on intermediate mountains. Elevation ranges from about 3,500 to 4,800 feet. Slopes range from 8 to 95 percent. The soils are coarse-loamy, mixed, mesic Typic Haplumbrepts.

Plott soils are associated with Chestnut, Cullasaja, Edneyville, and Tuckasegee soils. Chestnut soils are moderately deep. Chestnut and Edneyville soils have an ochric epipedon. Cullasaja soils are loamy-skeletal. Cullasaja and Tuckasegee soils formed in colluvium. Chestnut and Edneyville soils are on south- to west-facing slopes. Cullasaja and Tuckasegee soils are in coves, in drainageways, and on toe slopes.

Typical pedon of Plott fine sandy loam, 50 to 95 percent slopes, stony; west of Franklin on U.S. Highway 64 to Secondary Road 1448, south 1.8 miles on Secondary Road 1448 to U.S. Forest Service Road 67, south 0.6 mile on U.S. Forest Service Road 67 to Rock Gap, about 300 feet southeast of the gap on an old logging road, 75 feet south of the road (State plane coordinates 519,800 feet N., 649,100 feet E.):

Oi—2 inches to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A1—0 to 6 inches; very dark brown (10YR 2/2) fine sandy loam; weak medium granular structure; very friable; many fine to coarse roots; about 1 percent gravel; few fine flakes of mica; strongly acid; clear wavy boundary.

A2—6 to 14 inches; very dark grayish brown (10YR 3/2) fine sandy loam; moderate medium granular structure; very friable; many fine to coarse roots; about 3 percent gravel; few fine flakes of mica; strongly acid; clear wavy boundary.

Bw1—14 to 32 inches; dark yellowish brown (10YR 3/4) fine sandy loam; weak medium subangular blocky structure; very friable; common medium and coarse roots; about 4 percent gravel; few fine flakes of mica; strongly acid; gradual wavy boundary.

Bw2—32 to 46 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium subangular blocky structure; very friable; few medium and coarse

roots; about 4 percent gravel; few fine flakes of mica; strongly acid; gradual wavy boundary.

BC—46 to 62 inches; dark yellowish brown (10YR 4/6) gravelly fine sandy loam; weak medium subangular blocky structure; very friable; common fine roots; about 26 percent gravel; few fine flakes of mica; strongly acid.

The thickness of the solum ranges from 30 to more than 60 inches. The depth to bedrock is more than 60 inches. Reaction ranges from extremely acid to moderately acid in the A horizon, except where the surface layer has been limed, and from very strongly acid to moderately acid in the other horizons. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 35 percent. The rock fragments are dominantly gravel and cobbles. Some of the fragments, however, are stones.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 to 3.

The Bw horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 4 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The BC horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The C horizon, if it occurs, is multicolored saprolite that weathered from high-grade, metamorphic or igneous, felsic to mafic crystalline rocks, such as mica gneiss, hornblende gneiss, and granite. It is loamy sand, sandy loam, or fine sandy loam in the fine-earth fraction.

Reddies Series

The Reddies series consists of moderately well drained soils that are moderately deep to strata of sand, gravel, and cobbles and are very deep over bedrock. These soils are moderately rapidly permeable in the surface layer and subsoil and rapidly or very rapidly permeable in the underlying material. They formed in recent alluvium on flood plains along small streams. Elevation ranges from about 1,850 to 3,000 feet. Slopes range from 0 to 3 percent. The soils are coarse-loamy over sandy or sandy-skeletal, mixed, mesic Fluventic Haplumbrepts.

Reddies soils are associated with Dellwood, Nikwasi, and Rosman soils. Dellwood soils are sandy-skeletal. Nikwasi soils are poorly drained or very poorly drained. Rosman soils are deep to strata of sand, gravel, and cobbles. Dellwood soils are along stream channels. Nikwasi soils are in depressions. Rosman soils are in slightly elevated areas.

Typical pedon of Reddies fine sandy loam, 0 to 3 percent slopes, frequently flooded; along Allison Creek; west of Franklin on U.S. Highway 64 to Secondary Road 1448, south 1.2 miles on Secondary Road 1448, about 200 feet west of the road, in a pasture (State plane coordinates 528,000 feet N., 662,700 feet E.):

Ap—0 to 12 inches; dark brown (10YR 3/3) fine sandy loam; weak fine and medium granular structure; very friable; many fine roots; about 5 percent gravel; common fine flakes of mica; neutral; abrupt smooth boundary.

Bw1—12 to 20 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium subangular blocky structure; very friable; common fine roots; common fine flakes of mica; strongly acid; gradual wavy boundary.

Bw2—20 to 26 inches; yellowish brown (10YR 5/4) fine sandy loam; weak medium subangular blocky structure; very friable; few fine roots; about 5 percent gravel and 5 percent cobbles; common fine and medium flakes of mica; strongly acid; clear wavy boundary.

C1—26 to 35 inches; mottled dark grayish brown (10YR 4/2) and yellowish brown (10YR 5/4) loamy sand; massive; loose; about 5 percent gravel and 5 percent cobbles; common fine and medium flakes of mica; very strongly acid; abrupt wavy boundary.

C2—35 to 60 inches; multicolored very cobbly sand; massive; loose; about 20 percent gravel and 35 percent cobbles; common fine and medium flakes of mica; very strongly acid.

The thickness of the solum ranges from 20 to 39 inches. Horizons that contain more than 35 percent gravel or cobbles or both are within a depth of 20 to 40 inches. The depth to bedrock is more than 60 inches. Reaction ranges from very strongly acid to neutral. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 35 percent in the horizons above the skeletal alluvium. The rock fragments are dominantly gravel above the sandy-skeletal alluvium and gravel and cobbles in the sandy-skeletal alluvium.

The A horizon has hue of 10YR, value of 3, and chroma of 2 or 3.

The Bw horizon has hue of 10YR, value of 4 or 5, and chroma of 4 to 8. In some pedons it has few to many mottles with chroma of 2 or less below a depth of 20 inches. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The upper part of the C horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. It is loamy sand or sandy loam in the fine-earth fraction. The lower part of the C horizon is multicolored coarse sand, sand, or loamy sand in the fine-earth fraction. It has more than 35 percent rock fragments.

Rosman Series

The Rosman series consists of very deep, well drained, moderately rapidly permeable soils. These soils formed in recent alluvium on flood plains along the larger streams. Elevation ranges from about 1,900 to 2,500 feet. Slopes range from 0 to 2 percent. The soils are coarse-loamy, mixed, mesic Fluventic Haplumbrepts.

Rosman soils are associated with Arkaqua, Biltmore, and Toxaway soils. Arkaqua and Toxaway soils are fine-loamy. Also, Arkaqua soils are somewhat poorly drained. Toxaway soils are poorly drained or very poorly drained. Biltmore soils are sandy. Arkaqua and Toxaway soils are in backwater areas. Biltmore soils are on natural levees along the stream channels.

Typical pedon of Rosman fine sandy loam, 0 to 2 percent slopes, frequently flooded; about 3.5 miles north of Franklin on North Carolina Highway 28 to Secondary Road 1372, about 2.0 miles north on Secondary Road 1372 to Porter's farm, about 1,000 feet northeast of a farm house, 150 feet west of a river (State plane coordinates 578,400 feet N., 681,400 feet E.):

Ap—0 to 16 inches; dark brown (10YR 3/3) fine sandy loam; moderate fine granular structure; very friable; many fine and medium roots; few fine flakes of mica; moderately acid; gradual wavy boundary.

Bw—16 to 57 inches; strong brown (7.5YR 4/6) loam; weak medium subangular blocky structure; very friable; few fine flakes of mica; moderately acid; gradual wavy boundary.

C—57 to 60 inches; strong brown (7.5YR 5/6) fine sandy loam; massive; very friable; few fine flakes of mica; strongly acid.

The thickness of the solum ranges from 35 to 60 inches. The depth to bedrock is more than 60 inches. Reaction ranges from strongly acid to slightly acid, except where the surface layer has been limed. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 15 percent within a depth of 40 inches and from 0 to 50 percent below a depth of 40 inches. The rock fragments are dominantly gravel above a depth of 40 inches and gravel and cobbles below a depth of 40 inches.

The A horizon has hue of 10YR, value of 3, and chroma of 1 to 3.

The Bw horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The C horizon has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 3 to 8. It is loamy sand, sandy loam, or fine sandy loam in the fine-earth fraction.

Santeetlah Series

The Santeetlah series consists of very deep, well drained, moderately rapidly permeable soils. These soils formed in colluvium weathered from metasedimentary rocks, such as phyllite, slate, and metasandstone. They are in coves, in drainageways, and on toe slopes. Elevation ranges from about 2,000 to 4,800 feet. Slopes range from 8 to 50 percent. The soils are coarse-loamy, mixed, mesic Typic Haplumbrepts.

Santeetlah soils are associated with Cheoah, Soco, Spivey, and Stecoah soils. Cheoah soils are deep. Soco and Stecoah soils have an ochric epipedon. Also, Soco soils are moderately deep. Spivey soils formed in colluvium and are loamy-skeletal. Cheoah, Soco, and Stecoah soils are on the adjacent uplands, formed in residuum, and have a C horizon of saprolite. Spivey soils are intermingled with areas of the Santeetlah soils.

Typical pedon of Santeetlah loam, in an area of Spivey-Santeetlah complex, 15 to 30 percent slopes, stony; about 0.3 mile southeast of the Nantahala River power substation in Beechertown, about 100 feet south of Secondary Road 1310, in a wooded area (State plane coordinates 585,400 feet N., 606,000 feet E.):

Oi—2 inches to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A1—0 to 6 inches; black (10YR 2/1) loam; weak fine and medium granular structure; very friable; many fine to coarse roots; about 5 percent channers and 5 percent flagstones; few fine flakes of mica; strongly acid; clear wavy boundary.

A2—6 to 16 inches; very dark grayish brown (10YR 3/2) loam; moderate fine to coarse granular structure; very friable; few fine and many medium and coarse roots; about 5 percent channers and 5 percent flagstones; few fine flakes of mica; strongly acid; gradual wavy boundary.

Bw—16 to 42 inches; dark yellowish brown (10YR 4/4) loam; weak fine to coarse subangular blocky structure; very friable; common coarse roots; about 5 percent channers and 5 percent flagstones; few fine flakes of mica; very strongly acid; gradual wavy boundary.

BC—42 to 60 inches; dark yellowish brown (10YR 4/6) flaggy fine sandy loam; massive; friable; about 5 percent channers, 20 percent flagstones, 10 percent stones, and 10 percent boulders; few fine flakes of mica; very strongly acid.

The thickness of the solum ranges from 30 to more than 60 inches. The depth to bedrock is more than 60 inches. Reaction ranges from extremely acid to moderately acid, except where the surface layer has

been limed. The number of mica flakes is few or common. The content of rock fragments ranges from 5 to 35 percent within a depth of 40 inches and from 5 to 60 percent below a depth of 40 inches. The rock fragments are dominantly channers and flagstones above a depth of 40 inches and are channers, flagstones, stones, and boulders below a depth of 40 inches.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is fine sandy loam or loam in the fine-earth fraction.

The BC horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is fine sandy loam or loam in the fine-earth fraction. Typically, the content of rock fragments increases in the BC horizon compared to the overlying horizons.

The C horizon, if it occurs, has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8 or is multicolored. It is loamy sand, sandy loam, fine sandy loam, or loam in the fine-earth fraction.

Saunook Series

The Saunook series consists of very deep, well drained, moderately permeable soils. These soils formed in colluvium weathered from high-grade, metamorphic or igneous, felsic to mafic crystalline rocks, such as mica gneiss, hornblende gneiss, and granite. They are in coves, in drainageways, and on toe slopes. Elevation ranges from about 2,000 to 3,500 feet. Slopes range from 2 to 50 percent. The soils are fine-loamy, mixed, mesic Humic Hapludults.

Saunook soils are associated with Cowee, Evard, and Trimont soils. Cowee, Evard, and Trimont soils are on the adjacent uplands. They formed in residuum and have a C horizon of saprolite. Also, Cowee soils are moderately deep.

Typical pedon of Saunook gravelly loam, 15 to 50 percent slopes, stony; northeast of Franklin on U.S. Highway 441 to Secondary Road 1500, east on Secondary Road 1500 to U.S. Forest Service Road at Brown Creek, east 0.6 mile on U.S. Forest Service Road, about 1,000 feet south of the road, in a stand of eastern white pine (State plane coordinates 567,300 feet N., 712,600 feet E.):

Ap—0 to 10 inches; dark brown (7.5YR 3/2) gravelly loam; moderate fine and medium granular structure; very friable; many fine to coarse roots; about 10 percent gravel and 5 percent cobbles; few fine flakes of mica; strongly acid; clear wavy boundary.

Bt—10 to 34 inches; strong brown (7.5YR 4/6) clay loam; moderate medium subangular blocky structure; friable; few discontinuous clay films on faces of peds; common medium and coarse roots; about 5 percent gravel and 5 percent cobbles; few fine flakes of mica; strongly acid; gradual wavy boundary.

BC—34 to 44 inches; dark yellowish brown (10YR 4/6) cobbly fine sandy loam; weak medium subangular blocky structure; very friable; few medium and coarse roots; about 10 percent gravel and 15 percent cobbles; few fine flakes of mica; strongly acid; gradual wavy boundary.

C—44 to 60 inches; dark yellowish brown (10YR 4/6) very cobbly fine sandy loam; massive; friable; about 15 percent gravel and 25 percent cobbles; common fine flakes of mica; strongly acid.

The thickness of the solum ranges from 40 to more than 60 inches. The depth to bedrock is more than 60 inches. Reaction ranges from extremely acid to moderately acid in the A horizon, except where the surface layer has been limed, and ranges from very strongly acid to slightly acid in the B and C horizons. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 35 percent in the A and Bt horizons and from 5 to 60 percent in the BC and C horizons. The rock fragments are dominantly gravel in the A and Bt horizons and dominantly cobbles in the BC and C horizons.

The Ap or A horizon has hue of 7.5YR or 10YR, value of 3, and chroma of 2 to 4.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is loam, sandy clay loam, or clay loam in the fine-earth fraction.

The BC horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is fine sandy loam, loam, or sandy clay loam in the fine-earth fraction.

The C horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

Soco Series

The Soco series consists of moderately deep, well drained, moderately permeable soils. These soils formed in material weathered from metasedimentary rocks, such as phyllite, slate, and metasandstone. They are on low and intermediate mountains. Elevation ranges from about 2,000 to 4,800 feet. Slopes range from 8 to 95 percent. The soils are coarse-loamy, mixed, mesic Typic Dystrochrepts.

Soco soils are associated with Cheoah, Santeetlah, Spivey, and Stecoah soils. Cheoah, Santeetlah, and Spivey soils have an umbric epipedon. Also, Spivey soils are loamy-skeletal. Stecoah soils are deep. Cheoah soils are on north- to east-facing slopes.

Santeetlah and Spivey soils formed in colluvium. They are in coves, in drainageways, and on toe slopes. Stecoah soils are on the lower part of side slopes and in areas where the landscape breaks less sharply.

Typical pedon of Soco channery fine sandy loam, in an area of Soco-Stecoah complex, 30 to 50 percent slopes; west of Franklin on U.S. Highway 64 to Secondary Road 1310, west on Secondary Road 1310 to Secondary Road 1400, west on Secondary Road 1400 to Secondary Road 1401, west on Secondary Road 1401 to Secondary Road 1605 in Cherokee County, west on Secondary Road 1605 to U.S. Forest Service Road 708, south on U.S. Forest Service Road 708 to Wolf Creek Gap, 1,200 feet east of the gap (State plane coordinates 554,700 feet N., 588,200 feet E.):

Oi—1 inch to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A—0 to 5 inches; dark yellowish brown (10YR 4/4) channery fine sandy loam; moderate fine and medium granular structure; very friable; many fine to coarse roots; about 15 percent channers and 5 percent flagstones; few fine flakes of mica; extremely acid; clear smooth boundary.

Bw1—5 to 13 inches; strong brown (7.5YR 5/6) channery fine sandy loam; moderate medium subangular blocky structure; friable; common fine to coarse roots; about 15 percent channers and 5 percent flagstones; few fine flakes of mica; very strongly acid; gradual wavy boundary.

Bw2—13 to 22 inches; strong brown (7.5YR 5/6) flaggy fine sandy loam; weak medium subangular blocky structure; very friable; few medium and coarse roots; about 15 percent channers and 15 percent flagstones; few fine flakes of mica; very strongly acid; gradual irregular boundary.

Cr—22 to 35 inches; multicolored, weathered, interbedded metasandstone and phyllite; partially consolidated but can be dug with difficulty with a spade; few thin seams of strong brown (7.5YR 4/6) fine sandy loam in fractures.

The thickness of the solum ranges from 17 to 39 inches. The depth to weathered bedrock ranges from 20 to 40 inches. Reaction ranges from extremely acid to strongly acid, except where the surface layer has been limed. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 35 percent. The rock fragments are dominantly channers and flagstones.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 3 to 6. Where value and chroma are 3, the horizon is less than 7 inches thick.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The BC horizon, if it occurs, has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The C horizon, if it occurs, is multicolored saprolite that weathered from metasedimentary rocks. It is sandy loam or fine sandy loam in the fine-earth fraction.

The Cr horizon is multicolored, weathered metasedimentary bedrock, such as metasandstone, phyllite, and slate. It is partially consolidated but can be dug with difficulty with a spade.

Spivey Series

The Spivey series consists of very deep, well drained, moderately rapidly permeable and moderately permeable soils. These soils formed in colluvium weathered from metasedimentary rocks, such as phyllite, slate, and metasandstone. They are in coves, in drainageways, and on toe slopes. Elevation ranges from about 2,500 to 5,000 feet. Slopes range from 8 to 50 percent. The soils are loamy-skeletal, mixed, mesic Typic Haplumbrepts.

Spivey soils are associated with Cheoah, Oconaluftee, Santeetlah, Soco, and Stecoah soils. Cheoah, Oconaluftee, Santeetlah, Soco, and Stecoah soils are coarse-loamy. Also, Soco and Stecoah soils have an ochric epipedon. Soco soils are moderately deep. Oconaluftee soils are in the frigid temperature regime. Cheoah, Soco, and Stecoah soils are on the adjacent uplands. Santeetlah soils are intermingled with areas of the Spivey soils. Oconaluftee soils are on head slopes and ridges at elevations above 4,800 feet.

Typical pedon of Spivey very flaggy loam, in an area of Spivey-Santeetlah complex, 15 to 30 percent slopes, stony; about 0.25 mile southeast of the Nantahala River power substation in Beechertown, about 200 feet south of Secondary Road 1310, in a wooded area (State plane coordinates 585,500 feet N., 605,300 feet E.):

Oi—2 inches to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A1—0 to 10 inches; very dark brown (10YR 2/2) very flaggy loam; moderate fine and medium granular structure; very friable; many fine and medium and common coarse roots; about 15 percent channers, 20 percent flagstones, and 10 percent stones; few fine flakes of mica; very strongly acid; gradual wavy boundary.

A2—10 to 18 inches; dark brown (10YR 3/3) very flaggy loam; very dark brown material from the A1 horizon in old root channels; moderate fine and medium

granular structure; very friable; common fine to coarse roots; about 15 percent channers, 20 percent flagstones, and 10 percent stones; few fine flakes of mica; very strongly acid; gradual wavy boundary.

Bw1—18 to 34 inches; dark yellowish brown (10YR 4/4) very flaggy fine sandy loam; very dark brown and dark brown material from the A horizon in old root channels; weak fine and medium subangular blocky structure; very friable; common medium and coarse roots; about 10 percent channers, 25 percent flagstones, and 20 percent stones; few fine flakes of mica; strongly acid; clear wavy boundary.

Bw2—34 to 60 inches; dark brown (10YR 4/3) flaggy fine sandy loam; weak fine and medium subangular blocky structure; very friable; few medium and coarse roots; about 10 percent channers, 20 percent flagstones, 10 percent stones, and 20 percent boulders; few fine flakes of mica; strongly acid.

The thickness of the solum ranges from 30 to more than 60 inches. The depth to bedrock is more than 60 inches. Reaction ranges from extremely acid to moderately acid, except where the surface layer has been limed. The number of mica flakes ranges from none to common. The content of rock fragments ranges from 15 to 60 percent within a depth of 20 inches and is more than 35 percent below a depth of 20 inches. The rock fragments are channers, flagstones, stones, and boulders.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 to 3.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 8. It is dominantly sandy loam, fine sandy loam, or loam in the fine-earth fraction. In some pedons, however, it has thin layers, which are sandy clay loam in the fine-earth fraction.

The C horizon, if it occurs, has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 8 or is multicolored. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

Statler Series

The Statler series consists of very deep, well drained, moderately permeable soils. These soils formed in old alluvium on low stream terraces. Elevation ranges from about 1,900 to 2,500 feet. Slopes range from 1 to 5 percent. The soils are fine-loamy, mixed, mesic Humic Hapludults.

Statler soils are associated with Hemphill and Dillard soils. Hemphill soils are poorly drained and have more than 35 percent clay in the argillic horizon. Dillard soils are moderately well drained. Hemphill and Dillard soils are in depressions.

Typical pedon of Statler fine sandy loam, 1 to 5 percent slopes, rarely flooded; about 3.5 miles north of Franklin on North Carolina Highway 28 to North Carolina Highway 1372, about 2.0 miles north on North Carolina Highway 1372 to Porter's farm, 0.75 mile north of a farm house along a bend in a river (State plane coordinates 581,100 feet N., 681,600 feet E.):

Ap—0 to 10 inches; dark brown (10YR 3/3) fine sandy loam; weak fine granular structure; very friable; few fine flakes of mica; moderately acid; clear wavy boundary.

Bt—10 to 50 inches; strong brown (7.5YR 4/6) clay loam; moderate medium subangular blocky structure; friable; few faint clay films on faces of peds; few fine flakes of mica; slightly acid; gradual wavy boundary.

BC—50 to 60 inches; strong brown (7.5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable; common fine flakes of mica; slightly acid.

The thickness of the solum ranges from 40 to more than 60 inches. Generally, reaction is strongly acid or moderately acid, except where the surface layer has been limed. In some areas that have been limed in the past, however, the A horizon and the upper part of the Bt horizon range from moderately acid to neutral. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 15 percent in the A and B horizons and from 0 to 30 percent in the C horizon, if it occurs. The rock fragments are dominantly gravel in the A and B horizons and dominantly cobbles in the C horizon.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is loam, sandy clay loam, or clay loam in the fine-earth fraction.

The BC horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is fine sandy loam, loam, or sandy clay loam in the fine-earth fraction.

The C horizon, if it occurs, has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8 or is multicolored. It is fine sandy loam or loam in the fine-earth fraction.

The Statler soils in Macon County are taxadjuncts to the series because within a depth of 60 inches the decrease in content of clay is less than 20 percent from the maximum. This difference, however, does not affect the overall use, management, and behavior of these soils.

Stecoah Series

The Stecoah series consists of deep, well drained, moderately rapidly permeable soils. These soils formed in material weathered from metasedimentary rocks, such as phyllite, slate, and metasandstone. They are on low and intermediate mountains. Elevation ranges from about 2,000 to 4,800 feet. Slopes range from 8 to 95 percent. The soils are coarse-loamy, mixed, mesic Typic Dystrochrepts.

Stecoah soils are associated with Cheoah, Santeetlah, Soco, and Spivey soils. Cheoah, Santeetlah, and Spivey soils have an umbric epipedon. Also, Spivey soils are loamy-skeletal. Soco soils are moderately deep. Santeetlah and Spivey soils formed in colluvium. They are in coves, in drainageways, and on toe slopes. Cheoah soils are on north- to east-facing slopes. Soco soils are on the upper part of side slopes and in areas where the landscape breaks sharply.

Typical pedon of Stecoah channery fine sandy loam, in an area of Soco-Stecoah complex, 30 to 50 percent slopes; west on Secondary Road 1400 to Secondary Road 1401, west on Secondary Road 1401 to Secondary Road 1605 in Cherokee County, west on Secondary Road 1605 to U.S. Forest Service Road 708, south on U.S. Forest Service Road 708 to Wolf Creek Gap, about 1,400 feet east of the gap (State plane coordinates 554,700 feet N., 588,400 feet E.):

Oi—1 inch to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A—0 to 6 inches; dark yellowish brown (10YR 3/4) channery fine sandy loam; moderate fine and medium granular structure; very friable; many fine to coarse roots; about 15 percent channers and 5 percent flagstones; few fine flakes of mica; strongly acid; clear smooth boundary.

Bw—6 to 29 inches; strong brown (7.5YR 5/6) channery fine sandy loam; moderate medium subangular blocky structure; friable; common fine to coarse roots; about 15 percent channers and 5 percent flagstones; common fine flakes of mica; very strongly acid; gradual wavy boundary.

C—29 to 54 inches; mottled strong brown (7.5YR 4/6), pale brown (10YR 6/3), and yellowish brown (10YR 5/8) sandy loam that weathered from saprolite; massive; very friable; about 15 percent channers and 10 percent flagstones; common fine flakes of mica; strongly acid; gradual wavy boundary.

Cr—54 to 60 inches; multicolored, weathered, interbedded metasandstone and phyllite; partially consolidated but can be dug with difficulty with a spade; few thin seams of strong brown (7.5YR 4/6), pale brown (10YR 6/3), and yellowish brown (10YR 5/8) fine sandy loam in cracks between rocks.

The thickness of the solum ranges from 24 to 50 inches. The depth to weathered bedrock ranges from 40 to 60 inches. Reaction ranges from extremely acid to strongly acid, except where the surface layer has been limed. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 35 percent. The rock fragments are dominantly channers and flagstones.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 3 to 6. Where value and chroma are 3, the horizon is less than 7 inches thick.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is fine sandy loam or loam in the fine-earth fraction.

The BC horizon, if it occurs, has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is fine sandy loam or loam in the fine-earth fraction.

The C horizon is multicolored saprolite. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The Cr horizon is multicolored, weathered metasedimentary bedrock, such as metasandstone, phyllite, and slate. It is partially consolidated but can be dug with difficulty with a spade.

Sylco Series

The Sylco series consists of moderately deep, well drained, moderately permeable soils. These soils formed in material weathered from metasedimentary rocks, such as slate, phyllite, and metasandstone. They are on low and intermediate mountains. Elevation ranges from about 2,000 to 4,800 feet. Slopes range from 30 to 95 percent. The soils are loamy-skeletal, mixed, mesic Typic Dystrochrepts.

Sylco soils are associated with Cataska, Santeetlah, and Spivey soils. Cataska soils are shallow. They are intermingled with areas of the Sylco soils. Santeetlah and Spivey soils have an umbric epipedon and formed in colluvium. Santeetlah and Spivey soils are in drainageways.

Typical pedon of Sylco very channery loam, in an area of Cataska-Sylco complex, 50 to 95 percent slopes; in the Nantahala Gorge; northeast of the Nantahala Power Plant about 1.1 miles on U.S. Highway 19, about 2.1 miles southeast on Secondary Road 1412, about 50 feet east of the road (State plane coordinates 590,800 feet N., 600,300 feet E.):

Oi—2 inches to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A—0 to 6 inches; dark brown (10YR 3/3) very channery loam; moderate fine granular structure; very friable;

many fine to coarse roots; about 30 percent channers and 15 percent flagstones; very strongly acid; gradual wavy boundary.

Bw—6 to 22 inches; dark yellowish brown (10YR 4/4) very channery loam; weak fine subangular blocky structure; very friable; common fine to coarse roots; about 30 percent channers and 15 percent flagstones; strongly acid; gradual irregular boundary.

Cr—22 to 30 inches; multicolored, weathered, highly fractured slate; partially consolidated but can be dug with difficulty with a spade; few thin seams of dark yellowish brown (10YR 3/4) loam in cracks between rocks.

R—30 inches; hard, fractured slate.

The thickness of the solum ranges from 17 to 39 inches. The depth to weathered bedrock and hard bedrock ranges from 20 to 40 inches. Reaction ranges from extremely acid to strongly acid. The content of rock fragments ranges from 15 to 35 percent in the A horizon and is more than 35 percent in the B and C horizons.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4. Where value is 3 and chroma is 2 or 3, the horizon is less than 7 inches thick.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. It is loam or silt loam in the fine-earth fraction.

The Cr horizon is multicolored, weathered metasedimentary bedrock, such as slate, phyllite, and metasandstone. It is partially consolidated but can be dug with difficulty with a spade.

The R layer is hard slate, phyllite, or metasandstone.

Sylva Series

The Sylva series consists of very deep, poorly drained, moderately rapidly permeable soils. These soils formed in colluvium derived from high-grade, metamorphic or igneous, felsic to mafic crystalline rocks, such as mica gneiss, hornblende gneiss, and granite. They are in coves and drainageways. Elevation ranges from about 2,500 to 5,000 feet. Slopes range from 0 to 3 percent. The soils are coarse-loamy, mixed, acid, mesic Humic Haplaquepts.

Sylva soils are associated with Cullasaja, Nikwasi, Tuckasegee, and Whiteside soils. Cullasaja, Nikwasi, and Tuckasegee soils have an umbric epipedon. Also, Cullasaja and Tuckasegee soils are well drained. Cullasaja soils are loamy-skeletal. Whiteside soils are moderately well drained. Cullasaja, Tuckasegee, and Whiteside soils are in coves, in drainageways, and on toe slopes. Nikwasi soils are along small streams that flood.

Typical pedon of Sylva loam, in an area of Sylva-Whiteside complex, 0 to 3 percent slopes; about 2 miles east of Highlands on Secondary Road 1603, in Horse Cove about 100 feet north of the road, in an old field (State plane coordinates 496,400 feet N., 754,800 feet E.):

A1—0 to 4 inches; black (N 2/0) loam; weak fine granular structure; very friable; about 5 percent gravel; many fine and medium roots; common fine and medium flakes of mica; extremely acid; clear wavy boundary.

A2—4 to 8 inches; very dark grayish brown (2.5Y 3/2) loam; common fine distinct brown (10YR 5/3) mottles; weak medium granular structure; very friable; about 5 percent gravel; many fine and medium roots; common fine and medium flakes of mica; extremely acid; clear wavy boundary.

Bg1—8 to 16 inches; grayish brown (2.5Y 5/2) loam; common medium distinct dark brown (10YR 3/3) mottles; weak medium subangular blocky structure; very friable; about 5 percent gravel; few fine and medium roots; common fine and medium flakes of mica; very strongly acid; gradual wavy boundary.

Bg2—16 to 22 inches; light brownish gray (2.5Y 6/2) silty clay loam; weak medium subangular blocky structure; firm; few fine and medium roots; common fine flakes of mica; very strongly acid; gradual wavy boundary.

Bg3—22 to 32 inches; light brownish gray (2.5Y 6/2) sandy loam; weak medium subangular blocky structure; friable; about 5 percent gravel; few fine and medium roots; common fine and medium flakes of mica; very strongly acid; gradual wavy boundary.

Cg1—32 to 53 inches; light gray (2.5Y 7/2) loamy sand; massive; very friable; about 5 percent gravel; common medium and coarse flakes of mica; very strongly acid; gradual wavy boundary.

Cg2—53 to 60 inches; gray (2.5Y 6/1) loam; massive; friable; about 2 percent gravel; common fine and medium flakes of mica; very strongly acid.

The thickness of the solum ranges from 22 to 40 inches. The depth to bedrock is more than 60 inches. Reaction ranges from extremely acid to strongly acid, except where the surface layer has been limed. The number of mica flakes ranges from few to many. The content of rock fragments ranges from 0 to 15 percent.

The A horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 to 3, or it is neutral in hue and has value of 2 or 3.

The Bg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The Cg horizon has hue of 10YR or 2.5Y, value of 4

to 7, and chroma of 1 or 2. It is dominantly loamy sand, sandy loam, fine sandy loam, or loam in the fine-earth fraction. In some pedons, however, it has thin layers, lenses, or pockets of silty clay loam, sandy clay loam, or clay loam. Some pedons have a 2Cg horizon below a depth of 60 inches. It is multicolored, loamy saprolite that weathered from crystalline rock.

Toxaway Series

The Toxaway series consists of very deep, poorly drained and very poorly drained, moderately permeable soils. These soils formed in recent alluvium on flood plains along the major streams. Elevation ranges from about 1,900 to 2,500 feet. Slopes range from 0 to 2 percent. The soils are fine-loamy, mixed, nonacid, mesic Cumulic Humaquepts.

Toxaway soils are associated with Arkaqua, Biltmore, and Rosman soils. Arkaqua soils are somewhat poorly drained. Biltmore and Rosman soils are well drained. Also, Biltmore soils are sandy. Rosman soils are coarse-loamy. Arkaqua and Rosman soils are in slightly elevated areas nearer to the stream channels. Biltmore soils are on natural levees along the stream channels.

Typical pedon of Toxaway loam, 0 to 2 percent slopes, frequently flooded; south of Franklin on U.S. Highway 441 to Secondary Road 1649, east on Secondary Road 1649 to Secondary Road 1651, east on Secondary Road 1651 to Secondary Road 1653, north 0.3 mile on Secondary Road 1653, west about 700 feet, in a pasture (State plane coordinates 534,600 feet N., 692,400 feet E.):

A1—0 to 14 inches; dark brown (10YR 3/3) loam; moderate fine and medium granular structure; very friable; few fine flakes of mica; moderately acid; abrupt smooth boundary.

A2—14 to 36 inches; black (10YR 2/1) loam; moderate fine and medium granular structure; very friable; few fine flakes of mica; moderately acid; clear smooth boundary.

Cg1—36 to 42 inches; dark gray (10YR 4/1) loam; massive; firm; few fine flakes of mica; strongly acid; gradual wavy boundary.

Cg2—42 to 60 inches; light brownish gray (10YR 6/2) silty clay loam; massive; firm; many fine flakes of mica; strongly acid.

The thickness of the solum ranges from 24 to 50 inches. The thickness of the loamy layers ranges from 40 to more than 60 inches. Reaction ranges from strongly acid to slightly acid, except where the surface layer has been limed. The number of mica flakes ranges from few to many.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 to 3.

The Cg horizon has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 0 to 2, or it is neutral in hue. It is sandy loam, fine sandy loam, loam, silty clay loam, or clay loam.

Trimont Series

The Trimont series consists of very deep, well drained, moderately permeable soils (fig. 14). These soils formed in material weathered from high-grade, metamorphic, felsic to mafic crystalline rock, such as mica gneiss and hornblende gneiss. They are on low and intermediate mountains. Elevation ranges from about 2,200 to 3,800 feet. Slopes range from 30 to 95 percent. The soils are fine-loamy, mixed, mesic Humic Hapludults.

Trimont soils are associated with Cowee, Evard, Plott, and Saunook soils. Cowee and Evard soils have a lighter colored epipedon than that of the Trimont soils. Also, Cowee soils are moderately deep. Plott soils are coarse-loamy. Saunook soils formed in colluvium. Cowee and Evard soils are on south- to west-facing slopes. Plott soils are at higher elevations than the Trimont soils. Saunook soils are in drainageways.

Typical pedon of Trimont gravelly loam, 30 to 50 percent slopes, stony; south of Cartoogechaye on Secondary Road 1448 to Secondary Road 1128, southeast on Secondary Road 1128 to Secondary Road 1130, on Secondary Road 1130 to end of the road, east on U.S. Forest Service Road 763 to U.S. Forest Service Road 7225, southeast on U.S. Forest Service Road 7225 to Coweeta Gap, northeast on the U.S. Forest Service Road to Black Mountain (State plane coordinates 517,700 feet N., 669,800 feet E.):

Oi—2 inches to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A—0 to 9 inches; dark brown (7.5YR 3/2) gravelly loam; moderate fine to coarse granular structure; very friable; many fine and common coarse roots; about 10 percent gravel and 5 present cobbles; few fine flakes of mica; strongly acid; clear smooth boundary.

Bt1—9 to 23 inches; reddish brown (5YR 4/4) sandy clay loam; moderate fine and medium subangular blocky structure; friable; few faint clay films on faces of peds; common fine to coarse roots; about 5 percent gravel and 5 percent cobbles; few fine flakes of mica; strongly acid; gradual wavy boundary.

Bt2—23 to 34 inches; yellowish red (5YR 4/6) sandy clay loam; moderate fine to coarse subangular blocky structure; friable; few faint clay films on faces

of peds; common fine to coarse roots; about 5 percent gravel and 5 percent cobbles; few fine flakes of mica; strongly acid; gradual wavy boundary.

Bt3—34 to 45 inches; yellowish red (5YR 4/6) fine sandy loam; weak fine to coarse subangular blocky structure; friable; few faint clay films on faces of peds; few fine roots; about 5 percent cobbles; few fine flakes of mica; common fine prominent black (10YR 2/1) manganese stains; moderately acid; gradual wavy boundary.

C—45 to 60 inches; multicolored fine sandy loam that weathered from saprolite; massive; very friable; common fine flakes of mica; moderately acid.

The thickness of the solum ranges from 27 to 60 inches. The depth to bedrock is more than 60 inches. Reaction ranges from very strongly acid to moderately acid, except where the surface layer has been limed. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 35 percent. The rock fragments are dominantly gravel and cobbles.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 2 to 4.

The AB horizon, if it occurs, has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 2 to 4. It is loam, fine sandy loam, or sandy loam.

The Bt horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8. It is loam, sandy clay loam, or clay loam in the fine-earth fraction.

The BC horizon, if it occurs, has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The C horizon is multicolored saprolite that weathered from high-grade, metamorphic, felsic to mafic crystalline rock, such as mica gneiss and hornblende gneiss. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The Cr horizon, if it occurs, is multicolored, weathered crystalline bedrock. It is partially consolidated but can be dug with difficulty with a spade.

Tuckasegee Series

The Tuckasegee series consists of very deep, well drained, moderately rapidly permeable soils. These soils formed in colluvium weathered from high-grade, metamorphic or igneous, felsic to mafic crystalline rocks, such as mica gneiss, hornblende gneiss, and granite. They are in coves, in drainageways, and on toe slopes. Elevation ranges from about 3,500 to 5,000 feet. Slopes range from 2 to 95 percent. The soils are fine-loamy, mixed, mesic Typic Haplumbrepts.

Tuckasegee soils are associated with Chestnut, Cullasaja, Edneyville, Plott, and Whiteside soils. Chestnut and Edneyville soils have an ochric epipedon. Also, Chestnut soils are moderately deep. Cullasaja soils are loamy-skeletal. Plott soils formed in residuum and have a C horizon of saprolite. Whiteside soils are moderately well drained. Chestnut, Edneyville, and Plott soils are on the adjacent uplands. Cullasaja and Whiteside soils are intermingled with areas of the Tuckasegee soils.

Typical pedon of Tuckasegee fine sandy loam, in an area of Cullasaja-Tuckasegee complex, 15 to 30 percent slopes, stony; about 3.0 miles west of the Coweeta Hydrologic Station office on Shope Creek Road, about 150 feet upslope of a hairpin curve in the road, about 400 feet east of a weir on Watershed 36 (State plane coordinates 505,800 feet N., 664,500 feet E.):

Oi—2 inches to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A1—0 to 9 inches; black (10YR 2/1) fine sandy loam; moderate fine and medium granular structure; very friable; many fine, common medium, and few coarse roots; about 5 percent gravel; few fine flakes of mica; very strongly acid; clear smooth boundary.

A2—9 to 13 inches; dark brown (7.5YR 3/2) fine sandy loam; moderate fine and medium granular structure; very friable; common fine to coarse roots; about 5 percent gravel; few fine flakes of mica; very strongly acid; gradual wavy boundary.

Bw1—13 to 26 inches; dark brown (7.5YR 3/4) fine sandy loam; weak medium subangular blocky structure; friable; common medium and coarse roots; about 5 percent gravel and 5 percent cobbles; few fine flakes of mica; strongly acid; gradual wavy boundary.

Bw2—26 to 47 inches; brown (7.5YR 4/4) sandy clay loam; weak medium subangular blocky structure; friable; few medium and coarse roots; about 5 percent gravel, 5 percent cobbles, and 15 percent stones; few fine flakes of mica; strongly acid; gradual wavy boundary.

BC—47 to 65 inches; strong brown (7.5YR 4/6) cobbly sandy clay loam; weak medium subangular blocky structure; friable; few medium roots; about 10 percent gravel, 15 percent cobbles, and 30 percent stones; few fine flakes of mica; strongly acid.

The thickness of the solum ranges from 40 to more than 60 inches. The depth to bedrock is more than 72 inches. Reaction ranges from very strongly acid to moderately acid, except where the surface layer has been limed. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 35 percent within a depth of 40 inches and from 5 to 60 percent below a depth of 40 inches.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3.

The Bw horizon has hue of 7.5YR or 10YR, value of 3 to 6, and chroma of 4 to 8. It is sandy loam, fine sandy loam, loam, or sandy clay loam in the fine-earth fraction.

The BC horizon has hue of 7.5YR or 10YR, value of 3 to 6, and chroma of 4 to 8. It is sandy loam, fine sandy loam, loam, or sandy clay loam in the fine-earth fraction. It commonly has a higher content of rock fragments than the Bw horizon.

The C horizon, if it occurs, is similar in color to the Bw horizon or is multicolored. It is loamy coarse sand, loamy sand, or sandy loam in the fine-earth fraction.

Udorthents

Udorthents consist of areas where the layering of the natural soil has been destroyed by earthmoving equipment. Such activities as scraping, backfilling, trenching, and excavating have so altered the characteristics of the soil that a soil series can no longer be identified.

The excavated areas mainly are borrow pits from which the soil has been removed and used as foundation material for roads or buildings. The fill areas are sites where at least 20 inches of loamy, earthy fill material covers the natural soil, landfills, building sites, industrial sites, and playgrounds. They occur in any landscape position and are well drained or moderately well drained.

A typical pedon is not given for these soils because of their variability. Areas commonly are 2 to 20 feet thick. Some areas, however, are more than 50 feet thick. Landfill areas contain layers of nonsoil material covered by 2 or 3 feet of soil material.

The color of the Udorthents varies. It includes shades of red, yellow, and brown. The texture also varies. It includes loam, sandy loam, sandy clay loam, clay loam, and clay. Reaction ranges from extremely acid to moderately alkaline in areas where industrial waste having a high lime content has been deposited.

Wayah Series

The Wayah series consists of very deep, well drained, moderately rapidly permeable soils (fig. 15). These soils formed in material weathered from high-grade, metamorphic or igneous, felsic to mafic crystalline rocks, such as mica gneiss, hornblende gneiss, and granite. They are on high mountains. Elevation is generally more than 4,800 feet. Slopes range from 8 to 95 percent. The soils are coarse-loamy, mixed, frigid Typic Haplumbrepts.

Wayah soils are associated with Burton, Craggey, and Cullasaja soils. Burton soils are moderately deep. Craggey soils are shallow. Cullasaja soils formed in colluvium and are loamy-skeletal. Burton and Craggey soils are at the edge of small areas of rock outcrop. Cullasaja soils are at the head of drainageways and on toe slopes.

Typical pedon of Wayah sandy loam, windswept, 15 to 30 percent slopes, stony; on Wine Springs Bald; about 250 feet north of the intersection of U.S. Forest Service Roads 69 and 69B (State plane coordinates 549,800 feet N., 633,700 feet E.):

Oi—2 inches to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A1—0 to 8 inches; very dark brown (10YR 2/2) sandy loam; weak fine and medium granular structure; very friable; many fine to coarse roots; about 5 percent gravel and 5 percent cobbles; few fine flakes of mica; strongly acid; clear smooth boundary.

A2—8 to 13 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine and medium granular structure; very friable; many fine to coarse roots; about 5 percent gravel and 5 percent cobbles; few fine flakes of mica; strongly ácid; clear smooth boundary.

AB—13 to 15 inches; dark brown (10YR 4/3) fine sandy loam; weak fine and medium granular structure; very friable; many fine to coarse roots; about 5 percent gravel and 5 percent cobbles; few fine flakes of mica; strongly acid; clear smooth boundary.

Bw—15 to 27 inches; light olive brown (2.5Y 5/4) sandy loam; weak fine and medium subangular blocky structure; friable; few medium and coarse roots; about 5 percent gravel and 5 percent cobbles; few fine flakes of mica; medium acid; clear wavy boundary.

BC—27 to 37 inches; yellowish brown (10YR 5/4) sandy loam; weak fine and medium subangular blocky structure; very friable; about 5 percent gravel, 5 percent cobbles, and 5 percent stones; common fine and medium flakes of mica; strongly acid; gradual wavy boundary.

C—37 to 60 inches; multicolored loamy sand that weathered from saprolite; massive; very friable; about 5 percent gravel, 5 percent cobbles, and 5 percent stones; common fine and medium flakes of mica; strongly acid.

The thickness of the solum ranges from 20 to 50 inches. The depth to bedrock is more than 60 inches. Reaction ranges from extremely acid to strongly acid in

the A horizon, except where the surface layer has been limed, and from very strongly acid to moderately acid in the B and C horizons. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 35 percent. The rock fragments are dominantly gravel and cobbles. Some of the fragments, however, are stones.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 to 3. The AB horizon, if it occurs, has hue of 10YR and value and chroma of 3 or 4. It is loam, fine sandy loam, or sandy loam.

The Bw horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The BC horizon, if it occurs, has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 to 8. It is sandy loam or fine sandy loam in the fine-earth fraction. Typically, it has a higher content of rock fragments than the Bw horizon.

The C horizon is multicolored saprolite that weathered from high-grade, metamorphic or igneous, felsic to mafic crystalline rock, such as mica gneiss, hornblende gneiss, and granite. It is loamy sand or sandy loam in the fine-earth fraction.

Whiteside Series

The Whiteside series consists of very deep, moderately well drained, moderately permeable soils. These soils formed in colluvium weathered from high-grade, metamorphic or igneous, felsic to mafic crystalline rocks, such as mica gneiss, hornblende gneiss, and granite. They are in coves, in drainageways, and on toe slopes. Elevation ranges from about 3,500 to 5,000 feet. Slopes range from 1 to 15 percent. The soils are fine-loamy, mixed, mesic Aquic Hapludults.

Whiteside soils are associated with Cullasaja, Nikwasi, Sylva, and Tuckasegee soils. Cullasaja soils are loamy-skeletal. Nikwasi and Sylva soils are poorly drained or very poorly drained. Also, Nikwasi soils formed in alluvium and are subject to flooding. Tuckasegee soils are well drained. Cullasaja, Tuckasegee, and Sylva soils are intermingled with areas of the Whiteside soils. Nikwasi soils are on flood plains.

Typical pedon of Whiteside loam, in an area of Tuckasegee-Whiteside complex, 8 to 15 percent slopes; west of Franklin on U.S. Highway 64 to Secondary Road 1310, west on Secondary Road 1310 to U.S. Forest Service Road 711, north on U.S. Forest Service Road 711 to White Oak Creek, east upstream along White Oak Creek to Big Laurel Creek, south 0.5 mile (State plane coordinates 554,800 feet N., 635,900 feet E.):

Oi—2 inches to 0; partially decomposed leaves, twigs, roots, and other deciduous plant material.

A1—0 to 6 inches; very dark grayish brown (10YR 3/2) loam; moderate fine and medium granular structure; very friable; many fine to coarse roots; about 5 percent gravel and 5 percent cobbles; few fine flakes of mica; very strongly acid; clear smooth boundary.

A2—6 to 11 inches; dark brown (10YR 3/3) loam; moderate fine and medium granular structure; very friable; many fine to coarse roots; about 5 percent gravel and 5 percent cobbles; few fine flakes of mica; very strongly acid; gradual wavy boundary.

Bt1—11 to 16 inches; strong brown (7.5YR 5/6) clay loam; common medium distinct brownish yellow (10YR 6/8) and few medium distinct gray (10YR 6/1) mottles; weak medium subangular blocky structure; firm; few faint clay films on faces of peds; common medium and coarse roots; about 5 percent gravel and 5 percent cobbles; few fine flakes of mica; very strongly acid; gradual wavy boundary.

Bt2—16 to 28 inches; brownish yellow (10YR 6/8) loam; common medium distinct yellowish red (5YR 5/8) and few medium distinct gray (10YR 6/1) mottles; weak medium and coarse subangular blocky structure; friable; few faint clay films on faces of peds; few medium and coarse roots; about 5 percent gravel and 5 percent cobbles; few fine flakes of mica; very strongly acid; gradual wavy boundary.

Bt3—28 to 37 inches; brownish yellow (10YR 6/6) loam; few fine faint light brownish gray (10YR 6/2) mottles; weak medium and coarse subangular blocky structure; friable; few faint clay films on faces of peds; about 5 percent gravel and 5 percent cobbles; few fine flakes of mica; very strongly acid; gradual wavy boundary.

C—37 to 60 inches; mottled strong brown (7.5YR 5/8), brownish yellow (10YR 6/6), and light brownish gray (10YR 6/2) fine sandy loam; massive; friable; about 5 percent gravel and 5 percent cobbles; few fine and medium flakes of mica; very strongly acid.

The thickness of the solum ranges from 30 to 60 inches. The depth to bedrock is more than 72 inches. Reaction ranges from very strongly acid to moderately acid, except where the surface layer has been limed. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 15 percent. The rock fragments are dominantly gravel and cobbles.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 3 to 8. Mottles with chroma of 2 or less are within the upper 24 inches of the horizon. The texture is fine sandy loam, loam, sandy clay loam, or clay loam.

The BC horizon, if it occurs, has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 3 to 8. It is sandy loam, fine sandy loam, or loam.

The C horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 3 to 8 and is mottled with chroma of 2 or less. It is sandy loam, fine sandy loam, or loam. Some pedons have a 2C horizon. It is multicolored, loamy saprolite that weathered from high-grade, metamorphic or igneous, felsic to mafic crystalline rock.

The Cg horizon, if it occurs, has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It is sandy loam, fine sandy loam, or loam.

Formation of the Soils

Soils are formed by processes of the environment acting upon geologic agents, such as high-grade, metamorphic and metasedimentary rocks and the colluvium and alluvium derived from those rocks. The characteristics of a soil are determined by the combined influence of parent material, climate, plant and animal life, relief, and time. These five factors are responsible for the profile development and chemical properties that differentiate soils *(4)*.

Parent Material

Parent material is the unconsolidated mass in which a soil forms. The character of this mass affects the kind of profile that develops and the degree of development. In Macon County, parent material is a major factor affecting what kind of soil forms and it can be correlated to some degree to geologic formations. The general soil map is an approximate guide to the geology of the county.

The soils in the Hayesville-Braddock, Evard-Cowee-Saunook, Edneyville-Plott-Chestnut-Cullasaja, and Fannin-Chandler general soil map units formed in material weathered from high-grade metamorphic rocks, such as mica gneiss and mica schist. The soils in the Brasstown-Junaluska, Soco-Stecoah-Cheoah-Spivey, and Cataska-Sylco-Cheoah-Spivey general soil map units formed in material weathered from metasedimentary rocks, such as metasandstone, phyllite, and slate.

Climate

Climatic factors, particularly precipitation and temperature, affect the physical, chemical, and biological relationships in soil. They influence the rates at which rocks weather and organic matter decomposes. The amount of leaching in a soil is related to the amount of rainfall and the movement of water through the soil. The effects of climate also control the kinds of plants and animals that can thrive in a region. Temperature influences the kinds of organisms in a region and their growth. It also influences the speed of chemical and physical reactions in the soil.

In Macon County, the climate varies greatly in relationship to elevation and landscape position. For example, annual rainfall varies significantly in the county. It averages about 52 inches near the town of Franklin and about 85 inches near the town of Highlands. Localized microclimates are important to the soil forming processes in the county. The climate at any single place is influenced by elevation, aspect, and location relative to the moisture rich winds from the Gulf of Mexico.

The effects of climate are evident in the soils of the county. The high rainfall and cool temperatures in the high mountains produce brown, medium textured soils that have a high content of organic matter in the surface layer. The warmer temperatures in the low mountains and low rolling hills produce soils that are redder than those in the high mountains and that contain more clay in the subsoil.

Plant and Animal life

Plants and animals influence the formation and differentiation of soil horizons. The kind and number of organisms in and on the soil are determined partly by climate and partly by the nature of the soil material, the relief, and the age of the soil. Bacteria, fungi, and other micro-organisms aid in the weathering of rocks and in the decomposition of organic matter. The plants and animals that live on a soil are the primary source of organic material.

Plants generally determine the kinds and amounts of organic matter that enter a soil under normal conditions and how the organic matter is added. They also affect base status and the leaching process through the nutrient cycle.

Generally, the soils in the county formed under hardwood forest. Trees take up elements from the subsoil. They add organic matter to the surface layer by depositing leaves roots, twigs, and eventually branches and trunks. The material is acted upon by organisms and undergoes chemical reactions. In Macon County, plants do not bring enough bases to the surface layer to counteract the effects of leaching.

Animals convert complex compounds into simpler

forms, add organic matter to the soil, and modify certain chemical and physical properties of the soil. In Macon County, most of the organic material accumulates on the surface. It is acted upon by micro-organisms, fungi, earthworms, and other forms of life and by direct chemical reaction. It is then mixed with the uppermost mineral part of the soil by the activities of earthworms and other small invertebrates.

Generally, organic matter decomposes rapidly in the soils in low mountains that have moderate temperatures and direct sunlight. It accumulates at a slow rate in the surface layer of these soils. Soils in the high mountains or on aspects that are shaded from direct sunlight can accumulate a high content of organic matter in the surface layer.

Relief

Relief influences drainage, surface runoff, soil temperature, and the extent of geologic erosion. In Macon County, relief varies greatly. Slopes range from 0 to 95 percent in the county.

Relief affects the percolation of water through a soil profile. Water movement is important to soil formation because it aids chemical and biological reactions and is necessary for leaching.

Relief can affect drainage. For example, a high water table generally is related to nearly level or gently sloping soils.

Alluvial and colluvial soils commonly are less sloping than soils in the upland positions. They receive runoff from the surrounding uplands. Examples are Dellwood and Saunook soils.

Soil creep is an important factor affecting soil formation in mountainous areas. Generally, the upper part of most of the soils on side slopes formed in material that crept downslope from the higher areas. Soils that formed on ridgetops and shoulder slopes are much less affected by soil creep. These areas may be the only landscape positions where the soils are residual, or formed in place. Generally, soil depth increases down slope, especially on concave surfaces. Maximum soil thickness is in colluvial landscape positions in coves and along toe slopes.

Time

The length of time that soil material has been exposed to the soil-forming processes accounts for differences in the genetic development of soils. The formation of a well-defined soil profile, however, depends on other factors. Less time is required for a soil profile to develop in a warm climate than in a cool climate.

The soils in Macon County vary considerably in age. The length of the time that a soil has been forming is reflected in the profile. Old soils generally have more clay movement and accumulation in their horizons than young soils. In Macon County, the effects of time as a soil forming factor are more apparent in the older soils, such as Braddock soils, which are on the broader parts of high stream terraces. Young soils are along streams, have more sand, and may be underlain by strata of sand, gravel, and cobbles. Examples are Rosman and Reddies soils, which formed in recent alluvium. Other soils in the county are considered young because of their landscape position. For example, Cullasaja soils are not well developed because they are on strongly sloping to steep landscapes and are receiving material from geologic erosion.

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Glossary

Access road. A road constructed to facilitate the use and management of the land. Access roads are designed for limited traffic and typically consist of a cut slope, a roadbed, and an outslope of fill material.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Aquifer. A water-bearing bed or stratum of permeable rock, sand, or gravel capable of fielding considerable quantities of water to wells or springs.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Aspect. The direction in which a slope faces. Generally, cool aspects are north- to east-facing and warm aspects are south- to west-facing.

Atterberg limits. Atterberg limits are measured for soil materials passing the No. 40 sieve. They include the liquid limit (LL), which is the moisture content at which the soil passes from a plastic to a liquid state, and the plasticity index (PI), which is the water content corresponding to an arbitrary limit between the plastic and semisolid states of consistency of a soil.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Bald. A grass and shrub covered summit or other elevated area that is naturally bare of forest.

Balled and burlapped. A method of harvesting nursery plants in which burlap is wrapped around a ball of soil that is attached to the root system.

Basal area. The cross-sectional area of a tree bole measured at 4.5 feet above ground level. It is usually expressed in square feet of cross-sectional area per acre.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Biotite. A common rock-forming mineral consisting primarily of ferromagnesian silicate minerals. Color ranges from dark brown to green in thin section. Biotite is commonly referred to as "black mica" because of the natural black color.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. Generally, friction and soil disturbance are minimized by reeling in felled trees with one end lifted or the entire log suspended.

Capillary water. Water held as a film around soil

particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms-of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Channel flow. Water from roads, roofs, parking lots, and other impervious surfaces flowing into intermittent drainageways during and after heavy rainfall.

Channery soil. A soil that is, by volume, more than 15 percent thin, flat fragments of metasandstone, slate, or phyllite as much as 6 inches along the longest axis. A single piece is called a fragment.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clayey. A general textural term that includes sandy clay, silty clay, and clay. According to family level criteria in the soil taxonomic system, a specific textural name referring to fine earth (particles less than 2 millimeters in size) containing 35 percent or more clay, by weight, within the control section. The content of rock fragments is less than 35 percent, by volume.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Climax vegetation. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Clod. See Aggregate, soil.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse-loamy. According to family level criteria in the soil taxonomic system, soil containing less than 18 percent, by weight, clay and 15 percent or more fine sand or coarser material.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies

among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Cove. A wide, gently sloping to steep, concave colluvial area. Commonly at the head of or along drainageways in mountainous areas.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management. Use of that portion of the plant or crop left in the field after harvest for protection or improvement of the soil.

Crust. A thin, hard layer of soil material that forms on the surface in cultivated areas as the result of fine soil material settling out of ponding.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Dbh (diameter at breast height). The diameter of a tree at 4.5 feet above the ground level on the uphill side.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Delineation. The process of drawing or plotting features on a map with lines and symbols.

Denitrification. The biochemical reduction of nitrate or nitrite to gaseous nitrogen either as molecular nitrogen or as an oxide of nitrogen.

Depth class. Refers to the depth to a root-restricting layer. Unless otherwise stated, this layer is understood to be consolidated bedrock. The depth classes in this survey are:

Very shallow	less than 10 inches
Shallow	10 to 20 inches
Moderately deep	20 to 40 inches
Deep	40 to 60 inches
Very deep	more than 60 inches

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Drainageway. A narrow, gently sloping to very steep, concave colluvial area along an intermittent or perennial stream.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Engineering index test data. Laboratory test and mechanical analysis of selected soils in the county.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic)—Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated)—Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as fire, that exposes the surface.

Erosion classes. Classes based on estimates of past erosion. The classes are as follows:

Class 1.—Soils that have lost some of the original A horizon but on the average less than 25 percent of the original A horizon or of the uppermost 8 inches (if the original A horizon was less than 8 inches thick). Throughout most of the area, the thickness of the surface layer is within the normal range of variability of the uneroded soil. Class 1 erosion typically is not designated in the name of the map unit or in the map symbol.

Class 2.—Soils that have lost an average of 25 to 75 percent of the original A horizon or of the uppermost 8 inches (if the original A horizon was less than 8 inches thick). Throughout most cultivated areas of class 2 erosion, the surface layer consists of a mixture of the original A horizon and material from below. Some areas may have intricate patterns ranging from uneroded spots to spots where all of the original A horizon has been removed.

Class 3.—Soils that have lost an average of 75 percent or more of the original A horizon or of the uppermost 8 inches (if the original A horizon was less than 8 inches thick). In most cultivated areas of class 3 erosion, material that was below the original A horizon is exposed. The plow layer consists entirely or largely of this material.

Class 4.—Soils that have lost all of the original A horizon or of the uppermost 8 inches (if the original A horizon was less than 8 inches thick) plus some or all of the deeper horizons throughout most of the area. The original soil can be identified only in spots. Some areas may be smooth, but most have an intricate pattern of gullies.

Erosion hazard. Terms describing the potential for future erosion, inherent in the soil itself, in inadequately protected areas. The following definitions are based on estimated annual soil loss in tons per acre (values determined by the Universal Soil Loss Equation assuming bare soil conditions and using rainfall and climate factors for North Carolina):

0 tons per acre	none
Less than 1 ton per acre	slight
1 to 5 tons per acre	moderate
5 to 10 tons per acre	severe
More than 10 tons per acre	very severe

Evapotranspiration. The combined loss of water from a given area through surface evaporation and through transpiration by plants during a specified period.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Fault. A surface of rock rupture along which there has been differential movement.

Felsic rock. A general term for light colored igneous rock and some metamorphic crystalline rock.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fill slope. A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine-loamy. According to family level criteria in the soil taxonomic system, soil containing 18 to 35 percent, by weight, clay and 15 percent or more fine sand or coarser material.

Fine textured soil. Sandy clay, silty clay, or clay.

Firebreak. Area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and

equipment. Designated roads also serve as firebreaks.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist, 6 to 15 inches (15 to 37.5 centimeters) long.

Flooding. The temporary covering of the soil surface by flowing water from any source, such as overflowing streams, runoff from adjacent or surrounding slopes, and inflow from high tides. The frequency of flooding generally is expressed as none, rare, occasional, or frequent. *None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year). *Frequent* means that flooding occurs often under normal weather conditions (the chance of flooding is more than 50 percent in any year). The duration of flooding is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month).

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant that is not a grass or a sedge.

Forest type. A classification of forest land based on the species forming the majority of live-tree stocking.

Fragile (in tables). The soil is easily damaged by use or disturbance.

Frost action (in tables). Freezing and thawing of soil moisture can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Gneiss. A coarse grained metamorphic rock in which bands rich in granular minerals alternate with bands in which schistose minerals predominate. It is commonly formed by the metamorphism of granite.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Granite. A coarse grained igneous rock dominated by light colored minerals, consisting of about 50 percent orthoclase and 25 percent quartz with the balance being plagioclase feldspars and ferromagnesian silicates. Granites and granodiorites comprise 95 percent of all intrusive rocks.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

High-grade metamorphic rocks. Highly metamorphosed rocks, such as gneiss and schist.

High mountains. The part of the landscape that is above an elevation of about 4,600 feet. It is dominated by frigid soil temperatures.

High rainfall. Rainfall is high enough to compensate for droughty soils. Annual rainfall is normally more than 60 inches and is evenly distributed throughout the year.

High stream terrace. A terrace, commonly 20 feet or higher in elevation than the adjacent flood plain, that is no longer subject to flooding.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and

decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is, in part, a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as accumulation of clay, sesquioxides, humus, or a combination of these; prismatic or blocky structure; redder or browner colors than those in the A horizon; or a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated rock (unweathered bedrock) beneath the soil. The bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.

Hornblende. A rock-forming ferromagnesian silicate mineral of the amphibole group.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Hydroseeding. A method of applying seed, fertilizer, and mulch to steep areas by mixing those ingredients with water and spraying the slurry under pressure from a truck.

Igneous rock. Rock formed by solidification from a molten or partially molten state, generally crystalline in nature.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material. This contrasts with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Intermediate mountains. The part of the landscape that ranges from about 3,000 to 4,800 feet in elevation. It is dominated by mesic soil temperatures.

Intermediate rock. Igneous or metamorphic crystalline rock that is intermediate in composition between mafic and felsic rock.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Border.—Water is applied at the upper end of a

strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Landscape. A section or portion of the land. Examples are high, intermediate, and low mountains; low rolling hills; and flood plains. Parts of a landscape include side slopes, back slopes, toe slopes, foot slopes, ridgetops, ridge noses, and spur or finger ridges.

Landscape position. A particular location on a landscape. Examples are summit of a ridge, shoulder of a ridge, ridge nose, side slope, back slope, foot slope, toe slope, cove, and drainageway.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loamy. A general textural term that includes coarse sandy loam, sandy loam, fine sandy loam, very fine sandy loam, loam, silt loam, silt, clay loam, sandy clay loam, and silty clay loam. According to family level criteria in the soil taxonomic system, a specific textural name referring to fine earth (particles less than 2 millimeters in size) of loamy very fine sand or finer textured material that contains less than 35 percent clay, by weight, within the control section. The content of rock fragments is less than 35 percent, by volume.

Low mountains. The part of the landscape that ranges from about 2,500 to 3,500 feet in elevation. It is dominated by mesic soil temperatures.

Low rainfall. Rainfall so low that the droughty nature of some soils is apparent. Annual rainfall is normally less than 40 inches.

Low rolling hills. The part of the landscape that ranges from about 1,900 to 2,500 feet in elevation. It is dominated by mesic soils and has broad ridges and short side slopes.

Low stream terrace. A terrace in an area that floods, commonly 3 to 10 feet higher in elevation than the adjacent flood plain.

Low strength. The soil is not strong enough to support loads.

Mafic rock. A dark rock composed predominantly of magnesium silicates. It contains little quartz, feldspar, or muscovite mica.

Mean annual increment. The average yearly volume of a stand of trees from the year of origin to the age under consideration.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement.

Metasedimentary rock. Metamorphosed sedimentary rocks, such as phyllite, metasandstone, and conglomerate.

Metasediments. Parent material derived from metasedimentary rocks.

Micas. A group of silicate minerals characterized by sheet or scale cleavage. Biotite is the ferromagnesian black mica. Muscovite is the potassic white mica.

Microrelief. The concave to convex changes in the land surface occurring over a relatively short distance or small area, such as one acre.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally

indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Muscovite. A nonferromagnesian rock-forming silicate mineral with its tetrahedra arranged in sheets. It is commonly called "white mica" and sometimes called "potassic mica."

Natural soil. Soil material or saprolite that is in place and is not fill.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

No-till planting. A method of planting crops in which there is virtually no seedbed preparation. A thin slice of the soil is opened, and the seed is planted at the desired depth.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Overstory. The portion of the trees in a forest stand forming the upper crown cover.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Pegmatite. A small pluton of exceptionally coarse texture, commonly formed at the margin of a batholith characterized by graphic structure. Nearly 90 percent of all pegmatites are simple pegmatites of quartz, orthoclase, and unimportant percentages of micas.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water to move through the profile. Permeability is measured as the number of inches per hour that water moves through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Subsurface tunnels or pipelike cavities are formed by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential natural plant community. The total plant community that is best adapted to the combination of environmental factors and is in dynamic equilibrium with the environment.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of the acidity or alkalinity of a soil expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction

because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	below 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Reforestation. The process in which tree seedlings are planted or become naturally established in an area that was once forested.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Ridge. See Ridgetop.

Ridge nose. The landscape position that is the terminal point of a ridge or a spur ridge.

Ridgetop. The landscape position that is the crest of a hill or mountain.

Rill. A steep-sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Rippable bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 drawbar horsepower rating.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Runoff class (surface). Refers to the rate at which water flows away from the soil over the surface without infiltrating. Six classes of rate of runoff are recognized:

Ponded.—Little of the precipitation and water that runs onto the soil escapes as runoff, and free water stands on the surface for significant periods. The amount of water that is removed from ponded areas by movement through the soil, by plants, or by evaporation is usually greater than the total rainfall. Ponding normally occurs on level and nearly level soils in depressions. The water depth may fluctuate greatly.

Very slow.—Surface water flows away slowly, and free water stands on the surface for long periods or immediately enters the soil. Most of the water passes through the soil, is used by plants, or evaporates. The soils are commonly level or nearly level or are very porous.

Slow.—Surface water flows away so slowly that free water stands on the surface for moderate periods or enters the soil rapidly. Most of the water passes through the soil, is used by plants, or evaporates. The soils are nearly level or very gently sloping, or they are steeper but absorb precipitation very rapidly.

Medium.—Surface water flows away so rapidly that free water stands on the surface for only short periods. Part of the precipitation enters the soil and is used by plants, is lost by evaporation, or moves into underground channels. The soils are nearly level or gently sloping and absorb precipitation at a moderate rate, or they are steeper but absorb water rapidly.

Rapid.—Surface water flows away so rapidly that the period of concentration is brief and free water does not stand on the surface. Only a small part of the water enters the soil. The soils are mainly moderately steep or steep and have moderate or slow rates of absorption.

Very rapid.—Surface water flows away so rapidly that the period of concentration is very brief and free water does not stand on the surface. Only a small part of the water enters the soil. The soils are mainly steep or very steep and absorb precipitation slowly.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandy. A general textural term that includes coarse sand, sand, fine sand, very fine sand, loamy coarse sand, loamy sand, loamy fine sand, and loamy very fine sand. According to family level criteria in the soil taxonomic system, a specific textural name referring to fine earth (particles less than 2 millimeters in size) of sand or loamy sand that contains less than 50 percent very fine sand,

by weight, within the control section. The content of rock fragments is less than 35 percent, by volume.

Saprolite (soil science). Unconsolidated, residual material underlying the soil and grading to hard bedrock below.

Schist. A metamorphic rock dominated by fibrous or platy minerals. It has schistose cleavage and is a product of regional metamorphism.

Seasonal high water table. The highest level of a saturated zone (the apparent or perched water table) over a continuous period of more than 2 weeks in most years, but not a permanent water table.

Seep. A small area on the landscape where water oozes through the soil and causes the surface to remain wet. The water does not flow on the surface.

Seepage (in tables). The movement of water through the soil adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The landscape position, parallel to the summit, that is just below the ridgetop and just above the side slope.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Side slope. The landscape position that is just below the shoulder and just above the toe slope, occupying most of the mountainside or hillside.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Skidding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most systems involve pulling the trees with wire cables attached to a bulldozer or rubber-tired tractor. Generally, felled trees are skidded or pulled with one end lifted to reduce friction and soil disturbance.

Skid trails. The paths left from skidding logs and the bulldozer or tractor used to pull them.

Slate. A fine grained metamorphic rock with well developed slaty cleavage. Formed by the low-grade regional metamorphism of shale.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey area slope classes are as follows:

Nearly level	0 to 3 percent
Gently sloping	1 to 8 percent
Strongly sloping	8 to 15 percent
Moderately steep	15 to 30 percent
Steep	30 to 50 percent
Very steep	50 to 95 percent

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil compaction. An alteration of soil structure that ultimately can affect the biological and chemical properties of the soil. Compaction decreases the extent of voids and increases bulk density.

Soil map unit. A kind of soil or miscellaneous area or a combination of two or more soils or one or more soils and one or more miscellaneous areas that can be shown at the scale of mapping for the defined purposes and objectives of the soil survey. They are generally designed to reflect significant differences in use and management.

Soil puddling. This condition occurs in certain soils when they are driven over while they are wet. Exertion of mechanical force destroys the soil structure by compressing and shearing and results in the rearrangement of the soil particles to a massive or nonstructural state.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Soil strength. Load supporting capacity of a soil at specific moisture and density conditions.

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Spring. A small area on the landscape where water flows naturally through the soil onto the surface.

Spur ridge. A landscape position that is a sharply convex portion of a mountain side slope extending from the main ridge to some point of lower elevation.

Stand density. The degree to which an area is covered with living trees. It is usually expressed in units of basal areas per acre, number of trees per acre, or the percentage of ground covered by the tree canopy as viewed from above.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, thickness of the line can be one fragment or more. It generally overlies material that weathered in place, and it is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to soil blowing and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from soil blowing and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in organic matter content than the overlying surface layer.

Suitability ratings. Ratings for the degree of suitability of soils for pasture, crops, woodland, and engineering uses. The ratings and the general criteria used for their selection are as follows:
Well suited.—The intended use may be initiated and maintained by using only the standard materials and methods typically required for that use. Good results can be expected.
Suited or moderately suited.—The limitations affecting the intended use make special planning, design, or maintenance necessary.
Poorly suited.—The intended use is difficult or costly to initiate and maintain because of certain soil properties, such as steep slopes, a high hazard of erosion, a high water table, low fertility, and a hazard of flooding. Major soil reclamation, special design, or intensive management practices are needed.
Very poorly suited, not suited, or unsuited.—The intended use is very difficult or costly to initiate and maintain, and thus it generally should not be undertaken.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed on the contour or at a slight angle to the contour across sloping soils. The terrace intercepts surface runoff, so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine." The textural classes are defined as follows:

Sands (coarse sand, sand, fine sand, and very fine sand).—Soil material in which the content of sand is 85 percent or more and the percentage of silt plus 1½ times the percentage of clay does not exceed 15.

Loamy sands (loamy coarse sand, loamy sand, loamy fine sand, and loamy very fine sand).—Soil material in which, at the upper limit, the content of sand is 85 to 90 percent and the percentage of silt plus 1½ times the percentage of clay is not less than 15; at the lower limit, the content of sand is 70 to 85 percent and the percentage of silt plus twice the percentage of clay does not exceed 30.

Sandy loams (coarse sandy loam, sandy loam, fine sandy loam, and very fine sandy loam).—Soil material in which the content of clay is 20 percent or less, the percentage of silt plus twice the percentage of clay exceeds 30, and the content of sand is 52 percent or more or soil material in which the content of clay is less than 7 percent, the content of silt is less than 50 percent, and the content of sand is 43 to 52 percent.

Loam.—Soil material that contains 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand.

Silt loam.—Soil material that contains 50 or more percent silt and 12 to 27 percent clay or 50 to 80 percent silt and less than 12 percent clay.

Silt.—Soil material that contains 80 or more percent silt and less than 12 percent clay.

Sandy clay loam.—Soil material that contains 20 to 35 percent clay, less than 28 percent silt, and 45 or more percent sand.

Clay loam.—Soil material that contains 27 to 40 percent clay and 20 to 45 percent sand.

Silty clay loam.—Soil material that contains 27 to 40 percent clay and less than 20 percent sand.

Sandy clay.—Soil material that contains 35 or more percent clay and 45 or more percent sand.

Silty clay.—Soil material that contains 40 or more percent clay and 40 or more percent silt.

Clay.—Soil material that contains 40 or more percent clay, less than 45 percent sand, and less than 40 percent silt.

Thin layer (in tables). A layer of otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topography. The relative positions and elevations of the natural or manmade features of an area that describe the configuration of its surface.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, such as zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Ultra acid, sulfur-bearing rock. Rock rich in pyrite (iron disulfide).

Underlying material. Technically the C horizon; the part of the soil below the biologically altered A and B horizons.

Understory. The trees and other woody species growing under a more or less continuous cover of branches and foliage formed collectively by the upper portions of adjacent trees and other woody growth.

Universal soil loss equation. An equation used to design water erosion control systems. The equation is A=RKLSPC wherein A is the average annual soil loss in tons per acre per year, R is the rainfall factor, K is the soil erodibility factor, L is the length of slope, S is the steepness of slope, P is the conservation practice factor, and C is the cropping and management factor.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Water table (apparent). A thick zone of free water in the soil. The apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Water table (perched). A saturated zone of water in the soil standing above an unsaturated zone.

Water table (seasonal high). The highest level of a saturated zone in the soil (the apparent or perched water table) over a continuous period of more than 2 weeks in most years, but not a permanent water table.

Weathering. All physical and chemical changes produced by atmospheric agents in rocks or other deposits at or near the earth's surface. These

changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wetness. A general term applied to soils that hold water at or near the surface long enough to be a common management problem.

Windthrow. The uprooting and tipping over of trees by the wind.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Yarding paths. The paths left from cable-yarded logs as they are pulled uphill or downhill to a nearby central area.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1951-81 at Franklin, North Carolina)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January-----	50.0	25.1	37.6	71	-2	26	4.60	2.82	6.20	9	2.2
February----	53.3	26.5	39.9	74	3	25	4.69	2.42	6.66	8	2.5
March-------	60.6	33.2	46.9	81	10	75	5.99	3.88	7.89	10	1.1
April-------	70.9	41.0	56.0	87	22	194	4.36	2.57	5.95	8	.0
May---------	77.6	48.9	63.3	89	29	412	4.15	2.14	5.91	8	.0
June--------	83.0	57.0	70.0	93	39	600	4.32	2.59	5.86	9	.0
July--------	85.5	61.3	73.4	94	48	725	4.25	2.49	5.81	9	.0
August------	85.2	60.9	73.1	93	49	716	4.25	2.31	5.95	8	.0
September---	80.4	55.2	67.8	92	35	534	4.01	1.89	5.83	6	.0
October-----	71.7	41.8	56.8	85	19	222	3.27	1.26	4.97	6	.0
November----	61.1	32.0	46.6	79	10	41	3.52	2.19	4.70	6	.3
December----	52.4	26.7	39.6	72	3	19	4.58	2.33	6.53	8	1.4
Yearly:											
Average---	69.3	42.5	55.9	---	---	---	---	---	---	---	---
Extreme---	---	---	---	96	-3	---	---	---	---	---	---
Total-----	---	---	---	---	---	3,589	51.99	45.73	58.03	95	7.5

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1951-81 at Franklin, North Carolina)

Probability	Temperature		
	24 ^{o}F or lower	28 ^{o}F or lower	32 ^{o}F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 20	May 4	May 19
2 years in 10 later than--	Apr. 15	Apr. 29	May 14
5 years in 10 later than--	Apr. 4	Apr. 20	May 4
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 17	Oct. 6	Oct. 1
2 years in 10 earlier than--	Oct. 21	Oct. 11	Oct. 4
5 years in 10 earlier than--	Oct. 30	Oct. 20	Oct. 11

TABLE 3.--GROWING SEASON

(Recorded in the period 1951-81 at Franklin, North Carolina)

Probability	Daily minimum temperature during growing season		
	Higher than 24 ^{o}F	Higher than 28 ^{o}F	Higher than 32 ^{o}F
	Days	Days	Days
9 years in 10	187	162	142
8 years in 10	195	169	148
5 years in 10	209	183	160
2 years in 10	223	196	171
1 year in 10	230	203	177

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
ArA	Arkaqua loam, 0 to 2 percent slopes, frequently flooded	575	0.2
BeA	Biltmore sandy loam, 0 to 3 percent slopes, frequently flooded	214	0.1
BkB2	Braddock clay loam, 2 to 8 percent slopes, eroded	206	0.1
BkC2	Braddock clay loam, 8 to 15 percent slopes, eroded	1,405	0.4
BrC	Braddock-Urban land complex, 2 to 15 percent slopes	611	0.2
BrD	Braddock-Urban land complex, 15 to 30 percent slopes	148	*
BsC	Brasstown-Junaluska complex, 8 to 15 percent slopes	91	*
BsD	Brasstown-Junaluska complex, 15 to 30 percent slopes	1,159	0.3
BsE	Brasstown-Junaluska complex, 30 to 50 percent slopes	2,902	0.9
BsF	Brasstown-Junaluska complex, 50 to 95 percent slopes	546	0.2
BuD	Burton-Craggey-Rock outcrop complex, windswept, 15 to 30 percent slopes, stony	340	0.1
BuF	Burton-Craggey-Rock outcrop complex, windswept, 30 to 95 percent slopes, stony	355	0.1
CaE	Cashiers gravelly fine sandy loam, 30 to 50 percent slopes	833	0.3
CaF	Cashiers gravelly fine sandy loam, 50 to 95 percent slopes	687	0.2
CcF	Cataska-Sylco complex, 50 to 95 percent slopes	3,560	1.1
CdD	Chandler gravelly fine sandy loam, 15 to 30 percent slopes	1,141	0.3
CdE	Chandler gravelly fine sandy loam, 30 to 50 percent slopes	4,157	1.4
CdF	Chandler gravelly fine sandy loam, 50 to 95 percent slopes	2,115	0.6
ChE	Cheoah channery loam, 30 to 50 percent slopes	1,660	0.5
ChF	Cheoah channery loam, 50 to 95 percent slopes	6,505	2.0
CnC	Chestnut-Edneyville complex, windswept, 8 to 15 percent slopes, stony	97	*
CnD	Chestnut-Edneyville complex, windswept, 15 to 30 percent slopes, stony	507	0.2
CnE	Chestnut-Edneyville complex, windswept, 30 to 50 percent slopes, stony	638	0.2
CpD	Cleveland-Chestnut-Rock outcrop complex, windswept, 15 to 30 percent slopes	1,176	0.3
CpE	Cleveland-Chestnut-Rock outcrop complex, windswept, 30 to 50 percent slopes	2,062	0.6
CpF	Cleveland-Chestnut-Rock outcrop complex, windswept, 50 to 95 percent slopes	5,086	1.5
CsD	Cullasaja very cobbly fine sandy loam, 15 to 30 percent slopes, extremely bouldery	307	0.1
CsE	Cullasaja very cobbly fine sandy loam, 30 to 50 percent slopes, extremely bouldery	670	0.2
CuD	Cullasaja-Tuckasegee complex, 15 to 30 percent slopes, stony	18,847	5.7
CuE	Cullasaja-Tuckasegee complex, 30 to 50 percent slopes, stony	8,623	2.6
CuF	Cullasaja-Tuckasegee complex, 50 to 95 percent slopes, stony	144	*
DgB	Dellwood gravelly fine sandy loam, 0 to 5 percent slopes, frequently flooded	518	0.2
DrB	Dillard loam, 1 to 5 percent slopes, rarely flooded	238	0.1
DsB	Dillsboro loam, 2 to 8 percent slopes	545	0.2
DsC	Dillsboro loam, 8 to 15 percent slopes	130	*
EdB	Edneyville-Chestnut complex, 2 to 8 percent slopes, stony	1,109	0.3
EdC	Edneyville-Chestnut complex, 8 to 15 percent slopes, stony	3,464	1.0
EdD	Edneyville-Chestnut complex, 15 to 30 percent slopes, stony	9,805	2.9
EdE	Edneyville-Chestnut complex, 30 to 50 percent slopes, stony	21,163	6.4
EdF	Edneyville-Chestnut complex, 50 to 95 percent slopes, stony	15,732	4.7
EeC	Edneyville-Chestnut-Urban land complex, 2 to 15 percent slopes	430	0.1
EeD	Edneyville-Chestnut-Urban land complex, 15 to 30 percent slopes	373	0.1
EvB	Evard-Cowee complex, 2 to 8 percent slopes	79	*
EvC	Evard-Cowee complex, 8 to 15 percent slopes	5,155	1.5
EvD	Evard-Cowee complex, 15 to 30 percent slopes	28,506	8.6
EvE	Evard-Cowee complex, 30 to 50 percent slopes	43,406	13.0
EvF	Evard-Cowee complex, 50 to 95 percent slopes	17,888	5.4
ExC	Evard-Cowee-Urban land complex, 8 to 15 percent slopes	274	0.1
ExD	Evard-Cowee-Urban land complex, 15 to 30 percent slopes	376	0.1
FaC	Fannin fine sandy loam, 8 to 15 percent slopes	215	0.1
FaD	Fannin fine sandy loam, 15 to 30 percent slopes	2,854	0.8
FaE	Fannin fine sandy loam, 30 to 50 percent slopes	4,024	1.2
FaF	Fannin fine sandy loam, 50 to 95 percent slopes	562	0.2
HaB2	Hayesville clay loam, 2 to 8 percent slopes, eroded	173	0.1
HaC2	Hayesville clay loam, 8 to 15 percent slopes, eroded	1,526	0.5
HaD2	Hayesville clay loam, 15 to 30 percent slopes, eroded	2,526	0.7
HmA	Hemphill loam, 0 to 3 percent slopes, rarely flooded	232	0.1
NkA	Nikwasi fine sandy loam, 0 to 2 percent slopes, frequently flooded	1,263	0.4
OwE	Oconaluftee channery loam, windswept, 30 to 50 percent slopes	183	0.1
PwC	Plott fine sandy loam, 8 to 15 percent slopes, stony	98	*
PwD	Plott fine sandy loam, 15 to 30 percent slopes, stony	1,075	0.3
PwE	Plott fine sandy loam, 30 to 50 percent slopes, stony	8,415	2.5

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
PwF	Plott fine sandy loam, 50 to 95 percent slopes, stony	14,214	4.3
ReA	Reddies fine sandy loam, 0 to 3 percent slopes, frequently flooded	2,290	0.7
RhF	Rock outcrop-Cataska complex, 30 to 95 percent slopes	639	0.2
RkF	Rock outcrop-Cleveland complex, 30 to 95 percent slopes	4,964	1.5
RsA	Rosman fine sandy loam, 0 to 2 percent slopes, frequently flooded	2,554	0.8
SbC	Saunook gravelly loam, 8 to 15 percent slopes, stony	1,415	0.4
SbD	Saunook gravelly loam, 15 to 30 percent slopes, stony	10,041	3.0
SbE	Saunook gravelly loam, 30 to 50 percent slopes, stony	2,218	0.7
ScB	Saunook loam, 2 to 8 percent slopes	1,678	0.5
ScC	Saunook loam, 8 to 15 percent slopes	5,976	1.8
SoD	Soco-Stecoah complex, 15 to 30 percent slopes	212	0.1
SoE	Soco-Stecoah complex, 30 to 50 percent slopes	7,360	2.2
SoF	Soco-Stecoah complex, 50 to 95 percent slopes	9,823	2.9
SrC	Spivey-Santeetlah complex, 8 to 15 percent slopes, stony	871	0.3
SrD	Spivey-Santeetlah complex, 15 to 30 percent slopes, stony	3,519	1.0
SrE	Spivey-Santeetlah complex, 30 to 50 percent slopes, stony	5,462	1.6
StB	Statler fine sandy loam, 1 to 5 percent slopes, rarely flooded	669	0.2
SxE	Sylco-Cataska complex, 30 to 50 percent slopes	1,262	0.4
SyA	Sylva-Whiteside complex, 0 to 3 percent slopes	235	0.1
ToA	Toxaway loam, 0 to 2 percent slopes, frequently flooded	1,093	0.3
TrE	Trimont gravelly loam, 30 to 50 percent slopes, stony	2,272	0.7
TrF	Trimont gravelly loam, 50 to 95 percent slopes, stony	3,112	0.9
TsC	Tuckasegee-Cullasaja complex, 8 to 15 percent slopes, stony	1,681	0.5
TwB	Tuckasegee-Whiteside complex, 2 to 8 percent slopes	548	0.2
TwC	Tuckasegee-Whiteside complex, 8 to 15 percent slopes	2,133	0.6
Ud	Udorthents, loamy	2,401	0.7
UfB	Udorthents-Urban land complex, 0 to 5 percent slopes, rarely flooded	507	0.2
WeC	Wayah sandy loam, windswept, 8 to 15 percent slopes, stony	92	*
WeD	Wayah sandy loam, windswept, 15 to 30 percent slopes, stony	558	0.2
WeE	Wayah sandy loam, windswept, 30 to 50 percent slopes, stony	524	0.2
WeF	Wayah sandy loam, windswept, 50 to 95 percent slopes, stony	161	*
	Water	2,279	0.7
	Total	332,467	100.0

* Less than 0.1 percent.

TABLE 5.--PRIME FARMLAND

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
ArA	Arkaqua loam, 0 to 2 percent slopes, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
BkB2	Braddock clay loam, 2 to 8 percent slopes, eroded
DrB	Dillard loam, 1 to 5 percent slopes, rarely flooded
DsB	Dillsboro loam, 2 to 8 percent slopes
HaB2	Hayesville clay loam, 2 to 8 percent slopes, eroded
ReA	Reddies fine sandy loam, 0 to 3 percent slopes, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
RsA	Rosman fine sandy loam, 0 to 2 percent slopes, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
ScB	Saunook loam, 2 to 8 percent slopes
StB	Statler fine sandy loam, 1 to 5 percent slopes, rarely flooded
SyA	Sylva-Whiteside complex, 0 to 3 percent slopes (where drained)
ToA	Toxaway loam, 0 to 2 percent slopes, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
TwB	Tuckasegee-Whiteside complex, 2 to 8 percent slopes

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Corn	Corn silage	Cabbage	Tobacco	Cool-season grass	Alfalfa hay	Tomatoes
		Bu	Tons	Crates	Lbs	AUM*	Tons	Tons
ArA------------- Arkaqua	IIIw	135	25	525	---	10.0	3.5	26
BeA------------- Biltmore	IVw	90	17	400	2,400	5.5	---	26
BkB2------------ Braddock	IIIe	100	19	---	2,400	8.5	6.0	18
BkC2------------ Braddock	IVe	85	16	---	---	7.0	5.5	---
BrC**:								
Braddock-------	IVe	---	---	---	---	---	---	---
Urban land-----	VIIIs	---	---	---	---	---	---	---
BrD**:								
Braddock-------	VIe	---	---	---	---	---	---	---
Urban land-----	VIIIs	---	---	---	---	---	---	---
BsC:								
Brasstown------	IVe	---	---	---	---	6.0	---	---
Junaluska------	IVe	---	---	---	---	5.0	---	---
BsD:								
Brasstown------	VIe	---	---	---	---	6.0	---	---
Junaluska------	VIe	---	---	---	---	5.0	---	---
BsE:								
Brasstown------	VIIe	---	---	---	---	5.5	---	---
Junaluska------	VIIe	---	---	---	---	4.5	---	---
BsF:								
Brasstown------	VIIe	---	---	---	---	---	---	---
Junaluska------	VIIe	---	---	---	---	---	---	---
BuD**:								
Burton---------	VIe	---	---	---	---	5.0	---	---
Craggey--------	VIIs	---	---	---	---	3.0	---	---
Rock outcrop---	VIIIs	---	---	---	---	---	---	---
BuF**:								
Burton---------	VIIe	---	---	---	---	---	---	---
Craggey--------	VIIs	---	---	---	---	---	---	---
Rock outcrop---	VIIIs	---	---	---	---	---	---	---

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Corn silage	Cabbage	Tobacco	Cool-season grass	Alfalfa hay	Tomatoes
		Bu	Tons	Crates	Lbs	AUM*	Tons	Tons
CaE------------- Cashiers	VIIe	---	---	---	---	6.0	---	---
CaF------------- Cashiers	VIIe	---	---	---	---	---	---	---
CcF:								
Cataska---------	VIIs	---	---	---	---	---	---	---
Sylco-----------	VIIs	---	---	---	---	---	---	---
CdD------------- Chandler	VIe	---	---	---	---	7.0	---	---
CdE------------- Chandler	VIIe	---	---	---	---	6.0	---	---
CdF------------- Chandler	VIIe	---	---	---	---	---	---	---
ChE------------- Cheoah	VIIe	---	---	---	---	6.0	---	---
ChF------------- Cheoah	VIIe	---	---	---	---	---	---	---
CnC:								
Chestnut--------	IVe	---	---	---	---	6.0	---	---
Edneyville------	IVe	---	---	---	---	6.0	---	---
CnD:								
Chestnut--------	VIe	---	---	---	---	5.5	---	---
Edneyville------	VIe	---	---	---	---	6.5	---	---
CnE:								
Chestnut--------	VIIe	---	---	---	---	4.5	---	---
Edneyville------	VIIe	---	---	---	---	5.5	---	---
CpD**:								
Cleveland-------	VIIe	---	---	---	---	---	---	---
Chestnut--------	VIe	---	---	---	---	---	---	---
Rock outcrop----	VIIIs	---	---	---	---	---	---	---
CpE**, CpF**:								
Cleveland-------	VIIe	---	---	---	---	---	---	---
Chestnut--------	VIIe	---	---	---	---	4.0	---	---
Rock outcrop----	VIIIs	---	---	---	---	---	---	---
CsD, CsE-------- Cullasaja	VIIs	---	---	---	---	---	---	---
CuD:								
Cullasaja-------	VIIs	---	---	---	---	8.0	---	---

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Corn silage	Cabbage	Tobacco	Cool-season grass	Alfalfa hay	Tomatoes
		Bu	Tons	Crates	Lbs	AUM*	Tons	Tons
CuD:								
Tuckasegee-----	VIe	---	---	---	---	7.0	3.0	---
CuE:								
Cullasaja------	VIIs	---	---	---	---	7.0	---	---
Tuckasegee-----	VIIe	---	---	---	---	6.0	---	---
CuF:								
Cullasaja------	VIIs	---	---	---	---	---	---	---
Tuckasegee-----	VIIe	---	---	---	---	---	---	---
DgB------------- Dellwood	Vw	100	19	---	2,400	8.0	---	22
DrB------------- Dillard	IIw	135	25	500	2,800	10.0	4.5	28
DsB------------- Dillsboro	IIe	120	22	500	2,800	9.0	6.5	26
DsC------------- Dillsboro	IIIe	110	20	450	2,600	8.5	6.0	22
EdB:								
Edneyville-----	IIe	---	---	475	2,400	7.5	---	---
Chestnut-------	IIIe	---	---	425	---	6.5	---	---
EdC:								
Edneyville-----	IVe	---	---	475	2,100	7.5	---	---
Chestnut-------	IVe	---	---	425	---	6.5	---	---
EdD:								
Edneyville-----	VIe	---	---	---	---	7.0	---	---
Chestnut-------	VIe	---	---	---	---	6.0	---	---
EdE:								
Edneyville-----	VIIe	---	---	---	---	6.5	---	---
Chestnut-------	VIIe	---	---	---	---	5.5	---	---
EdF:								
Edneyville-----	VIIe	---	---	---	---	---	---	---
Chestnut-------	VIIe	---	---	---	---	---	---	---
EeC**:								
Edneyville-----	IVe	80	---	---	2,300	6.5	---	---
Chestnut-------	IVe	70	---	400	---	5.5	---	---
Urban land-----	VIIIs	---	---	---	---	---	---	---
EeD**:								
Edneyville-----	VIe	---	---	---	---	5.5	---	---
Chestnut-------	VIe	---	---	---	---	4.5	---	---

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Corn silage	Cabbage	Tobacco	Cool-season grass	Alfalfa hay	Tomatoes
		Bu	Tons	Crates	Lbs	AUM*	Tons	Tons
EeD**:								
Urban land	VIIIs	---	---	---	---	---	---	---
EvB:								
Evard	IIe	110	20	---	2,500	8.5	6.0	---
Cowee	IIIe	90	18	---	2,300	8.0	5.0	---
EvC:								
Evard	IVe	90	17	---	2,300	8.0	5.5	---
Cowee	IVe	80	15	---	2,100	5.0	4.5	---
EvD:								
Evard	VIe	---	---	---	---	6.5	---	---
Cowee	VIe	---	---	---	---	6.0	---	---
EvE:								
Evard	VIIe	---	---	---	---	6.0	---	---
Cowee	VIIe	---	---	---	---	5.5	---	---
EvF:								
Evard	VIIe	---	---	---	---	---	---	---
Cowee	VIIe	---	---	---	---	---	---	---
ExC**:								
Evard	IVe	---	---	---	---	---	---	---
Cowee	IVe	---	---	---	---	---	---	---
Urban land	VIIIs	---	---	---	---	---	---	---
ExD**:								
Evard	VIe	---	---	---	---	---	---	---
Cowee	VIe	---	---	---	---	---	---	---
Urban land	VIIIs	---	---	---	---	---	---	---
FaC Fannin	VIe	---	---	---	2,200	7.0	5.0	---
FaD, FaE Fannin	VIIe	---	---	---	---	6.0	---	---
FaF Fannin	VIIe	---	---	---	---	---	---	---
HaB2 Hayesville	IIIe	100	19	---	2,400	8.0	6.0	18
HaC2 Hayesville	IVe	85	16	---	2,200	7.0	5.0	---
HaD2 Hayesville	VIe	---	---	---	---	6.5	---	---

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Corn silage	Cabbage	Tobacco	Cool-season grass	Alfalfa hay	Tomatoes
		Bu	Tons	Crates	Lbs	AUM*	Tons	Tons
HmA*** Hemphill	IVw	120	22	---	---	9.5	---	26
NkA Nikwasi	VIw	---	---	---	---	5.0	---	---
OwE Oconaluftee	VIIe	---	---	---	---	---	---	---
PwC Plott	IVe	---	---	---	---	7.0	---	---
PwD Plott	VIe	---	---	---	---	7.0	---	---
PwE Plott	VIIe	---	---	---	---	6.0	---	---
PwF Plott	VIIe	---	---	---	---	---	---	---
ReA Reddies	IIIw	120	22	450	2,800	9.0	4.5	28
RhF**:								
Rock outcrop	VIIIs	---	---	---	---	---	---	---
Cataska	VIIe	---	---	---	---	---	---	---
RkF**:								
Rock outcrop	VIIIs	---	---	---	---	---	---	---
Cleveland	VIIe	---	---	---	---	---	---	---
RsA Rosman	IIIw	135	25	450	3,000	10.0	4.5	30
SbC Saunook	IVe	120	22	450	2,800	9.0	5.5	28
SbD Saunook	VIe	---	---	---	---	8.0	---	---
SbE Saunook	VIIe	---	---	---	---	6.0	---	---
ScB Saunook	IIe	135	25	450	3,000	10.0	6.5	30
ScC Saunook	IVe	120	22	450	2,800	9.0	5.5	28
SoD:								
Soco	VIe	---	---	---	---	4.5	---	---
Stecoah	VIe	---	---	---	---	5.5	---	---
SoE:								
Soco	VIIe	---	---	---	---	3.5	---	---
Stecoah	VIIe	---	---	---	---	4.5	---	---

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Corn silage	Cabbage	Tobacco	Cool-season grass	Alfalfa hay	Tomatoes
		Bu	Tons	Crates	Lbs	AUM*	Tons	Tons
SoF:								
Soco------------	VIIe	---	---	---	---	---	---	---
Stecoah---------	VIIe	---	---	---	---	---	---	---
SrC:								
Spivey----------	VIIs	110	20	425	2,300	8.5	4.5	25
Santeetlah------	IVe	130	24	475	2,800	10.0	5.5	30
SrD:								
Spivey----------	VIIs	---	---	---	---	7.5	---	---
Santeetlah------	VIe	---	---	---	---	8.5	---	---
SrE:								
Spivey----------	VIIs	---	---	---	---	5.5	---	---
Santeetlah------	VIIe	---	---	---	---	6.5	---	---
StB-------------- Statler	IIe	135	25	400	3,000	10.0	6.5	30
SxE:								
Sylco-----------	VIIs	---	---	---	---	---	---	---
Cataska---------	VIIs	---	---	---	---	---	---	---
SyA:								
Sylva-----------	IIIw	---	---	---	---	---	---	---
Whiteside-------	IIw	---	---	---	---	---	---	---
ToA-------------- Toxaway	IIIw	120	22	450	---	9.5	---	---
TrE-------------- Trimont	VIIe	---	---	---	---	6.0	---	---
TrF-------------- Trimont	VIIe	---	---	---	---	---	---	---
TsC:								
Tuckasegee------	IIIe	130	24	---	3,000	10.0	5.5	30
Cullasaja-------	VIIs	---	---	---	---	9.0	---	---
TwB:								
Tuckasegee------	IIe	---	---	525	---	9.0	---	---
Whiteside-------	IIe	---	---	475	---	7.5	---	---
TwC:								
Tuckasegee------	IIIe	---	---	525	---	8.5	5.0	---
Whiteside-------	IIIe	---	---	475	---	7.0	---	---
Ud--------------- Udorthents	VIIe	---	---	---	---	---	---	---

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Corn silage	Cabbage	Tobacco	Cool-season grass	Alfalfa hay	Tomatoes
		Bu	Tons	Crates	Lbs	AUM*	Tons	Tons
UFB**:								
Udorthents-----	VIIs	---	---	---	---	---	---	---
Urban land-----	VIIIs	---	---	---	---	---	---	---
WeC------------- Wayah	IVe	---	---	---	---	6.0	---	---
WeD------------- Wayah	VIe	---	---	---	---	6.0	---	---
WeE------------- Wayah	VIIe	---	---	---	---	5.5	---	---
WeF------------- Wayah	VIIe	---	---	---	---	---	---	---

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

*** Yields are for drained conditions.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume[1]	Trees to plant
ArA-------------Arkaqua	12W	Slight	Moderate	Slight	Severe	Eastern white pine--	90	166	Eastern white pine, shortleaf pine, Virginia pine, black walnut, yellow-poplar, northern red oak.
						Black walnut--------	100	---	
						Yellow-poplar-------	100	107	
						Shortleaf pine------	75	120	
						Virginia pine-------	80	122	
						River birch---------	---	---	
						Black cherry--------	---	---	
						American sycamore---	---	---	
BeA-------------Biltmore	8A	Slight	Slight	Slight	Moderate	Yellow-poplar-------	106	117	Yellow-poplar, eastern white pine, American sycamore, black walnut.
						Eastern white pine--	---	---	
						Northern red oak----	---	---	
						White oak-----------	---	---	
						American sycamore---	---	---	
						White ash-----------	---	---	
						River birch---------	---	---	
						Black cherry--------	---	---	
						Black walnut--------	---	---	
BkB2, BkC2------Braddock	4C	Slight	Moderate	Slight	Moderate	Northern red oak----	80	62	Eastern white pine.
						Yellow-poplar-------	90	90	
						Eastern white pine--	95	176	
BsC[2]:									
Brasstown------	4A	Slight	Slight	Slight	Moderate	Scarlet oak---------	80	62	Eastern white pine.
						White oak-----------	80	62	
						Eastern white pine--	91	168	
						Shortleaf pine------	71	112	
						Virginia pine-------	74	114	
						Pitch pine----------	---	---	
						Northern red oak----	---	---	
						Black oak-----------	---	---	
						Chestnut oak--------	---	---	
						Hickory-------------	---	---	
						Black locust--------	---	---	
						Red maple-----------	---	---	
Junaluska------	3D	Slight	Slight	Moderate	Moderate	Scarlet oak---------	65	48	Eastern white pine.
						Chestnut oak--------	56	39	
						White oak-----------	61	44	
						Shortleaf pine------	68	106	
						Virginia pine-------	65	100	
						Eastern white pine--	86	157	
						Pitch pine----------	---	---	
						Northern red oak----	---	---	
						Black oak-----------	---	---	
						Hickory-------------	---	---	
						Red maple-----------	---	---	
						Blackgum------------	---	---	
						Black locust--------	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume[1]	Trees to plant
BsD[2]:									
Brasstown	4R	Moderate	Moderate	Slight	Moderate	Scarlet oak	80	62	Eastern white pine.
						White oak	80	62	
						Eastern white pine	91	168	
						Shortleaf pine	71	112	
						Virginia pine	74	114	
						Pitch pine	---	---	
						Northern red oak	---	---	
						Black oak	---	---	
						Chestnut oak	---	---	
						Hickory	---	---	
						Black locust	---	---	
						Red maple	---	---	
Junaluska	3R	Moderate	Moderate	Moderate	Moderate	Scarlet oak	65	48	Eastern white pine.
						Chestnut oak	56	39	
						White oak	61	44	
						Shortleaf pine	68	106	
						Virginia pine	65	100	
						Eastern white pine	86	157	
						Pitch pine	---	---	
						Northern red oak	---	---	
						Black oak	---	---	
						Hickory	---	---	
						Red maple	---	---	
						Blackgum	---	---	
						Black locust	---	---	
BsE[2], BsF[2]:									
Brasstown	4R	Severe	Severe	Slight	Moderate	Scarlet oak	80	62	Eastern white pine.
						White oak	80	62	
						Eastern white pine	91	168	
						Shortleaf pine	71	112	
						Virginia pine	74	114	
						Pitch pine	---	---	
						Northern red oak	---	---	
						Black oak	---	---	
						Chestnut oak	---	---	
						Hickory	---	---	
						Black locust	---	---	
						Red maple	---	---	
Junaluska	3R	Severe	Severe	Moderate	Moderate	Scarlet oak	65	48	Eastern white pine.
						Chestnut oak	56	39	
						White oak	61	44	
						Shortleaf pine	68	106	
						Virginia pine	65	100	
						Eastern white pine	86	157	
						Pitch pine	---	---	
						Northern red oak	---	---	
						Black oak	---	---	
						Hickory	---	---	
						Red maple	---	---	
						Blackgum	---	---	
						Black locust	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume[1]	Trees to plant
BuD[2]:									
Burton	2R	Moderate	Moderate	Moderate	Slight	Northern red oak	40	26	
						Red spruce	---	---	
						Fraser fir	---	---	
						Yellow birch	---	---	
						Sugar maple	---	---	
						Sweet birch	---	---	
Craggey	2D	Moderate	Moderate	Severe	Slight	Northern red oak	40	26	
						Red spruce	---	---	
						Fraser fir	---	---	
						Yellow birch	---	---	
						Sugar maple	---	---	
						Sweet birch	---	---	
Rock outcrop.									
BuF[2]:									
Burton	2R	Severe	Severe	Moderate	Slight	Northern red oak	40	26	
						Red spruce	---	---	
						Fraser fir	---	---	
						Yellow birch	---	---	
						Sugar maple	---	---	
						Sweet birch	---	---	
Craggey	2R	Severe	Severe	Severe	Slight	Northern red oak	40	2	
						Red spruce	---	---	
						Fraser fir	---	---	
						Yellow birch	---	---	
						Sugar maple	---	---	
						Sweet birch	---	---	
Rock outcrop.									
CaE, CaF: Cashiers	7R	Severe	Severe	Slight	Moderate	Yellow-poplar	93	95	Yellow-poplar, eastern white pine, Fraser fir[3].
						Eastern white pine	91	168	
						Northern red oak	84	66	
						Eastern hemlock	---	---	
						Yellow buckeye	---	---	
						American beech	---	---	
						White ash	---	---	
						Red maple	---	---	
						Eastern hemlock	---	---	
						Black cherry	---	---	
						Sweet birch	---	---	
						Sugar maple	---	---	
						Hickory	---	---	
						Scarlet oak	---	---	
						White oak	---	---	
						Black oak	---	---	
CcF[2]:									
Cataska	2R	Moderate	Severe	Severe	Moderate	Chestnut oak	40	26	Virginia pine.
						Scarlet oak	40	26	
						Pitch pine	40	---	
						Virginia pine	---	---	
						Eastern white pine	---	---	
						Hickory	---	---	
						Black oak	---	---	
						White oak	---	---	
						Shortleaf pine	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume[1]	Trees to plant
CcF[2]:									
Sylco	5R	Moderate	Severe	Moderate	Moderate	Shortleaf pine	50	68	Virginia pine.
						Virginia pine	50	68	
						Eastern white pine	---	---	
						Hickory	---	---	
						Black oak	---	---	
						White oak	---	---	
						Shortleaf pine	---	---	
CdD Chandler	3R	Moderate	Moderate	Slight	Moderate	Chestnut oak	67	49	Eastern white pine.
						Eastern white pine	88	162	
						Shortleaf pine	72	114	
						Virginia pine	74	114	
						Pitch pine	---	---	
						Northern red oak	---	---	
						Scarlet oak	---	---	
						Hickory	---	---	
						Yellow-poplar	---	---	
						White oak	67	---	
						Red maple	---	---	
						Black oak	---	---	
CdE, CdF Chandler	3R	Severe	Severe	Slight	Moderate	Chestnut oak	67	49	Eastern white pine.
						Eastern white pine	88	162	
						Shortleaf pine	72	114	
						Virginia pine	74	114	
						Pitch pine	---	---	
						Northern red oak	---	---	
						Scarlet oak	---	---	
						Hickory	---	---	
						Yellow-poplar	---	---	
						White oak	67	---	
						Red maple	---	---	
						Black oak	---	---	
ChE, ChF Cheoah	4R	Severe	Severe	Slight	Moderate	Northern red oak	83	65	Fraser fir[3], northern red oak, yellow-poplar.
						Yellow-poplar	103	112	
						American beech	80	---	
						Black cherry	---	---	
						Eastern hemlock	---	---	
						Black oak	---	---	
						Yellow birch	---	---	
						Sugar maple	---	---	
						Red maple	---	---	
						Yellow buckeye	---	---	
						Black birch	---	---	
						Scarlet oak	---	---	
						White oak	---	---	
						Hickory	---	---	
CnC[2]:									
Chestnut	2D	Slight	Slight	Moderate	Slight	Northern red oak	45	30	
						Scarlet oak	---	---	
						Eastern white pine	---	---	
						Virginia pine	---	---	
						Hickory	---	---	
						Chestnut oak	---	---	
						Pitch pine	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume[1]	Trees to plant
CnC[2]:									
Edneyville-----	2A	Slight	Slight	Slight	Slight	Northern red oak----	45	30	
						Scarlet oak---------	---	---	
						Eastern white pine--	---	---	
						Virginia pine-------	---	---	
						Hickory-------------	---	---	
						Chestnut oak--------	---	---	
						Pitch pine----------	---	---	
CnD[2]:									
Chestnut-------	2R	Moderate	Moderate	Moderate	Slight	Northern red oak----	45	30	
						Scarlet oak---------	---	---	
						Eastern white pine--	---	---	
						Virginia pine-------	---	---	
						Hickory-------------	---	---	
						Chestnut oak--------	---	---	
						Pitch pine----------	---	---	
Edneyville-----	2R	Moderate	Moderate	Slight	Slight	Northern red oak----	45	30	
						Scarlet oak---------	---	---	
						Eastern white pine--	---	---	
						Virginia pine-------	---	---	
						Hickory-------------	---	---	
						Chestnut oak--------	---	---	
						Pitch pine----------	---	---	
CnE[2]:									
Chestnut-------	2R	Severe	Severe	Moderate	Slight	Northern red oak----	45	30	
						Scarlet oak---------	---	---	
						Eastern white pine--	---	---	
						Virginia pine-------	---	---	
						Hickory-------------	---	---	
						Chestnut oak--------	---	---	
						Pitch pine----------	---	---	
Edneyville-----	2R	Severe	Severe	Slight	Slight	Northern red oak----	45	30	
						Scarlet oak---------	---	---	
						Eastern white pine--	---	---	
						Virginia pine-------	---	---	
						Hickory-------------	---	---	
						Chestnut oak--------	---	---	
						Pitch pine----------	---	---	
CpD[2]:									
Cleveland------	2D	Moderate	Moderate	Severe	Slight	Chestnut oak--------	40	26	
						Scarlet oak---------	---	---	
						Northern red oak----	---	---	
						Eastern white pine--	---	---	
						Virginia pine-------	---	---	
						Pitch pine----------	---	---	
						Hickory-------------	---	---	
Chestnut-------	2R	Moderate	Moderate	Moderate	Slight	Northern red oak----	45	30	
						Scarlet oak---------	---	---	
						Eastern white pine--	---	---	
Rock outcrop.									

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume[1]	Trees to plant
CpE[2], CpF[2]:									
Cleveland	2R	Severe	Severe	Severe	Slight	Chestnut oak	40	26	
						Scarlet oak	---	---	
						Northern red oak	---	---	
						Eastern white pine	---	---	
						Virginia pine	---	---	
						Hickory	---	---	
						Pitch pine	---	---	
Chestnut	2R	Severe	Severe	Moderate	Slight	Northern red oak	45	30	
						Scarlet oak	---	---	
						Eastern white pine	---	---	
						Virginia pine	---	---	
						Hickory	---	---	
						Chestnut oak	---	---	
						Pitch pine	---	---	
Rock outcrop.									
CsD: Cullasaja	8X	Moderate	Severe	Slight	Severe	Yellow-poplar	109	122	Fraser fir[3].
						Black cherry	---	---	
						Yellow birch	---	---	
						Northern red oak	---	---	
						American beech	---	---	
						Yellow buckeye	---	---	
						Eastern hemlock	---	---	
						Eastern white pine	---	---	
						Sweet birch	---	---	
						Sugar maple	---	---	
CsE: Cullasaja	8R	Severe	Severe	Slight	Severe	Yellow-poplar	109	122	Fraser fir[3].
						Black cherry	---	---	
						Yellow birch	---	---	
						Northern red oak	---	---	
						American beech	---	---	
						Yellow buckeye	---	---	
						Eastern hemlock	---	---	
						Eastern white pine	---	---	
						Sweet birch	---	---	
						Sugar maple	---	---	
CuD[2]:									
Cullasaja	8R	Moderate	Moderate	Slight	Severe	Yellow-poplar	109	122	Fraser fir[3].
						Black cherry	---	---	
						Northern red oak	---	---	
						Yellow birch	---	---	
						American beech	---	---	
						Eastern hemlock	---	---	
						Yellow buckeye	---	---	
						Eastern white pine	---	---	
						Sweet birch	---	---	
						Sugar maple	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume[1]	Trees to plant
CuD[2]: Tuckasegee	8R	Moderate	Moderate	Slight	Severe	Yellow-poplar	109	122	Yellow-poplar, eastern white pine, northern red oak, black cherry, Fraser fir[3].
						Eastern white pine	98	182	
						Northern red oak	---	---	
						Black cherry	---	---	
						Eastern hemlock	---	---	
						White oak	---	---	
						Yellow birch	---	---	
						American beech	---	---	
						White ash	---	---	
						Black locust	---	---	
						Yellow buckeye	---	---	
						Sugar maple	---	---	
						Red maple	---	---	
						Sweet birch	---	---	
CuE[2], CuF[2]: Cullasaja	8R	Severe	Severe	Slight	Severe	Yellow-poplar	109	122	Fraser fir[3].
						Black cherry	---	---	
						Northern red oak	---	---	
						Yellow birch	---	---	
						American beech	---	---	
						Eastern hemlock	---	---	
						Yellow buckeye	---	---	
						Eastern white pine	---	---	
						Sweet birch	---	---	
						Sugar maple	---	---	
Tuckasegee	8R	Severe	Severe	Slight	Severe	Yellow-poplar	109	122	Yellow-poplar, eastern white pine, northern red oak, black cherry, Fraser fir[3].
						Eastern white pine	98	182	
						Northern red oak	---	---	
						Black cherry	---	---	
						Eastern hemlock	---	---	
						White oak	---	---	
						Yellow birch	---	---	
						American beech	---	---	
						White ash	---	---	
						Black locust	---	---	
						Yellow buckeye	---	---	
						Sugar maple	---	---	
						Red maple	---	---	
						Sweet birch	---	---	
DgB: Dellwood	8F	Slight	Slight	Slight	Moderate	Yellow-poplar	100	107	Yellow-poplar, eastern white pine.
						Eastern white pine	91	168	
						Red maple	---	---	
						River birch	---	---	
						American sycamore	---	---	
						Eastern hemlock	---	---	
						Sweet birch	---	---	
						Black cherry	---	---	
DrB: Dillard	7A	Slight	Slight	Slight	Moderate	Yellow poplar	95	98	Eastern white pine, eastern eastern white pine, black walnut, yellow-poplar.
						Eastern white pine	90	166	
						Shortleaf pine	75	120	
						Virginia pine	80	112	
						American sycamore	---	---	
						Sweet birch	---	---	
						Black cherry	---	---	
						American beech	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume[1]	Trees to plant
DsB, DsC: Dillsboro	7A	Slight	Slight	Slight	Moderate	Yellow-poplar	95	98	Yellow-poplar, eastern white pine, Fraser fir[3], black walnut.
						Eastern white pine	---	---	
						Shortleaf pine	---	---	
						Virginia pine	---	---	
						White oak	---	---	
						Scarlet oak	---	---	
						Northern red oak	---	---	
						Black cherry	---	---	
						American beech	---	---	
EdB[2], EdC[2]: Edneyville[4]	4A	Slight	Slight	Slight	Moderate	Northern red oak	80	62	Eastern white pine, yellow-poplar, Fraser fir[3].
						Shortleaf pine	64	97	
						Virginia pine	66	102	
						Eastern white pine	90	---	
						Yellow-poplar	98	---	
						Chestnut oak	---	---	
						Scarlet oak	---	---	
						Black oak	---	---	
						Pitch pine	---	---	
						White oak	---	---	
						Hickory	---	---	
Chestnut	4D	Slight	Slight	Moderate	Moderate	Northern red oak	76	58	Eastern white pine, yellow-poplar, Fraser fir[3].
						Eastern white pine	78	139	
						Yellow-poplar	97	102	
						Scarlet oak	68	50	
						White oak	70	52	
						Black oak	71	53	
						Chestnut oak	69	51	
						Shortleaf pine	---	---	
						Pitch pine	---	---	
EdD[2]: Edneyville	4R	Moderate	Moderate	Slight	Moderate	Northern red oak	80	62	Eastern white pine, yellow-poplar, Fraser fir[3].
						Shortleaf pine	64	97	
						Virginia pine	66	102	
						Eastern white pine	90	166	
						Yellow-poplar	98	104	
						Chestnut oak	---	---	
						Scarlet oak	---	---	
						Black oak	---	---	
						Pitch pine	---	---	
						White oak	---	---	
						Hickory	---	---	
Chestnut	4R	Moderate	Moderate	Moderate	Moderate	Northern red oak	76	58	Eastern white pine, yellow-poplar, Fraser fir[3].
						Eastern white pine	78	139	
						Yellow-poplar	97	102	
						Scarlet oak	68	50	
						White oak	70	52	
						Black oak	71	53	
						Chestnut oak	69	51	
						Shortleaf pine	---	---	
						Pitch pine	---	---	
						Hickory	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume[1]	Trees to plant
EdE[2], EdF[2]:									
Edneyville	4R	Severe	Severe	Slight	Moderate	Northern red oak	80	62	Eastern white pine, yellow-poplar, Fraser fir[3].
						Shortleaf pine	64	97	
						Virginia pine	66	102	
						Eastern white pine	90	106	
						Yellow-poplar	98	104	
						Chestnut oak	---	---	
						Scarlet oak	---	---	
						Black oak	---	---	
						Pitch pine	---	---	
						White oak	---	---	
						Hickory	---	---	
Chestnut	4R	Severe	Severe	Moderate	Moderate	Northern red oak	76	58	Eastern white pine, yellow-poplar, Fraser fir[3].
						Eastern white pine	78	139	
						Yellow-poplar	97	102	
						Scarlet oak	68	50	
						White oak	70	52	
						Black oak	71	53	
						Chestnut oak	69	51	
						Shortleaf pine	---	---	
						Pitch pine	---	---	
						Hickory	---	---	
EvB[2], EvC[2]:									
Evard[5]	4A	Slight	Slight	Slight	Moderate	Chestnut oak	68	50	Eastern white pine.
						Shortleaf pine	73	116	
						Pitch pine	77	---	
						Virginia pine	69	107	
						Eastern white pine	93	172	
						Yellow-poplar	95	97	
						White oak	95	---	
						Southern red oak	75	---	
						Northern red oak	---	---	
						Hickory	---	---	
						Scarlet oak	---	---	
						Black oak	---	---	
						Red maple	---	---	
Cowee	3D	Slight	Slight	Moderate	Moderate	Chestnut oak	55	---	Eastern white pine, shortleaf pine, Scotch pine.
						Virginia pine	63	---	
						Scarlet oak	54	---	
						Shortleaf pine	78	---	
						Eastern white pine	78	---	
						Yellow-poplar	80	---	
						Pitch pine	---	---	
						Northern red oak	---	---	
						Black oak	---	---	
						White oak	---	---	
						Hickory	---	---	
						Red maple	---	---	
						Blackgum	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume[1]	Trees to plant
EvD[2]:									
Evard[5]	4R	Moderate	Moderate	Slight	Moderate	Chestnut oak	68	50	Eastern white pine, yellow-poplar.
						Shortleaf pine	73	116	
						Pitch pine	77	---	
						Virginia pine	69	107	
						Eastern white pine	93	172	
						Yellow-poplar	95	92	
						White oak	---	---	
						Southern red oak	---	---	
						Northern red oak	---	---	
						Hickory	---	---	
						Scarlet oak	---	---	
						Black oak	---	---	
						Red maple	---	---	
Cowee	3R	Moderate	Moderate	Moderate	Moderate	Chestnut oak	55	38	Eastern white pine.
						Virginia pine	63	96	
						Scarlet oak	54	38	
						Shortleaf pine	78	126	
						Eastern white pine	78	139	
						Yellow-poplar	80	71	
						Pitch pine	---	---	
						Northern red oak	---	---	
						Black oak	---	---	
						White oak	---	---	
						Hickory	---	---	
						Red maple	---	---	
						Blackgum	---	---	
EvE[2], EvF[2]:									
Evard[5]	4R	Severe	Severe	Slight	Moderate	Chestnut oak	68	54	Eastern white pine, yellow-poplar.
						Shortleaf pine	73	116	
						Pitch pine	77	---	
						Virginia pine	79	107	
						Eastern white pine	93	172	
						Yellow-poplar	95	92	
						White oak	---	57	
						Southern red oak	---	57	
						Northern red oak	---	---	
						Hickory	---	---	
						Scarlet oak	---	---	
						Black oak	---	---	
						Red maple	---	---	
Cowee	3R	Severe	Severe	Moderate	Moderate	Chestnut oak	55	38	Eastern white pine.
						Virginia pine	63	96	
						Scarlet oak	54	38	
						Shortleaf pine	78	126	
						Eastern white pine	78	139	
						Yellow-poplar	80	71	
						Pitch pine	---	---	
						Northern red oak	---	---	
						Black oak	---	---	
						White oak	---	---	
						Hickory	---	---	
						Red maple	---	---	
						Blackgum	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume[1]	Trees to plant
FaC: Fannin	7A	Slight	Slight	Slight	Moderate	Yellow-poplar	96	100	Eastern white pine, Fraser fir[3].
						Northern red oak	---	---	
						Eastern white pine	89	164	
						Pitch pine	---	---	
						Shortleaf pine	---	---	
						Virginia pine	---	---	
						Scarlet oak	---	---	
						Chestnut oak	---	---	
						White oak	---	---	
						Red maple	---	---	
						Black oak	---	---	
						Hickory	---	---	
FaD: Fannin	7R	Moderate	Moderate	Slight	Moderate	Yellow-poplar	96	100	Eastern white pine, Fraser fir[3].
						Northern red oak	---	---	
						Eastern white pine	89	164	
						Pitch pine	---	---	
						Shortleaf pine	---	---	
						Virginia pine	---	---	
						Scarlet oak	---	---	
						Chestnut oak	---	---	
						White oak	---	---	
						Red maple	---	---	
						Black oak	---	---	
						Hickory	---	---	
FaE, FaF: Fannin	7R	Severe	Severe	Slight	Moderate	Yellow-poplar	96	100	Eastern white pine, Fraser fir[3].
						Northern red oak	---	---	
						Eastern white pine	89	164	
						Pitch pine	---	---	
						Shortleaf pine	---	---	
						Virginia pine	---	---	
						Scarlet oak	---	---	
						Chestnut oak	---	---	
						White oak	---	---	
						Red maple	---	---	
						Black oak	---	---	
						Hickory	---	---	
HaB2, HaC2: Hayesville	6C	Slight	Moderate	Slight	Moderate	Yellow-poplar	85	81	Eastern white pine.
						Eastern white pine	77	137	
						Northern red oak	---	---	
						Pitch pine	---	---	
						Shortleaf pine	68	106	
						Virginia pine	70	109	
						Northern red oak	---	---	
						Scarlet oak	---	---	
						Chestnut oak	---	---	
						Black oak	---	---	
						White oak	---	---	
						Hickory	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume[1]	Trees to plant
HaD2: Hayesville	6R	Moderate	Moderate	Slight	Moderate	Yellow-poplar	85	81	Eastern white pine.
						Eastern white pine	77	137	
						Northern red oak	---	---	
						Pitch pine	---	---	
						Shortleaf pine	68	106	
						Virginia pine	70	109	
						Northern red oak	---	---	
						Scarlet oak	---	---	
						Chestnut oak	---	---	
						Black oak	---	---	
						White oak	---	---	
						Hickory	---	---	
HmA: Hemphill[6]	6W	Slight	Severe	Slight	Severe	Yellow-poplar	88	86	Eastern white pine.
						Red maple	---	---	
						Yellow birch	---	---	
						Eastern hemlock	---	---	
						Eastern white pine	---	---	
NkA: Nikwasi	6W	Slight	Severe	Slight	Severe	Yellow-poplar	88	86	Eastern white pine.
						Eastern white pine	86	157	
						American sycamore	---	---	
						Red maple	---	---	
						Yellow birch	---	---	
						Eastern hemlock	---	---	
						Sweet birch	---	---	
OwE: Oconaluftee	2R	Severe	Severe	Slight	Slight	Northern red oak	40	26	
						Red spruce	---	---	
						Fraser fir	---	---	
						Sweet birch	---	---	
						Yellow birch	---	---	
PwC: Plott	5A	Slight	Slight	Slight	Moderate	Northern red oak	85	67	Fraser fir[3], northern red oak, yellow-poplar, black cherry.
						Yellow-poplar	113	128	
						Black cherry	---	---	
						American beech	---	---	
						Sugar maple	---	---	
						Eastern hemlock	---	---	
						Black oak	---	---	
						Yellow birch	---	---	
						Black locust	---	---	
						Sweet birch	---	---	
						Scarlet oak	---	---	
						White oak	---	---	
						Hickory	---	---	
PwD: Plott	5R	Moderate	Moderate	Slight	Moderate	Northern red oak	85	67	Fraser fir[3], northern red oak, yellow-poplar, black cherry.
						Yellow-poplar	113	128	
						Black cherry	---	---	
						American beech	---	---	
						Sugar maple	---	---	
						Eastern hemlock	---	---	
						Black oak	---	---	
						Yellow birch	---	---	
						Black locust	---	---	
						Sweet birch	---	---	
						Scarlet oak	---	---	
						White oak	---	---	
						Hickory	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume[1]	Trees to plant
PwE, PwF: Plott	5R	Severe	Severe	Slight	Moderate	Northern red oak	85	67	Fraser fir[3], northern red oak, yellow-poplar, black cherry.
						Yellow-poplar	113	128	
						Black cherry	---	---	
						American beech	---	---	
						Sugar maple	---	---	
						Eastern hemlock	---	---	
						Black oak	---	---	
						Yellow birch	---	---	
						Black locust	---	---	
						Sweet birch	---	---	
						Scarlet oak	---	---	
						White oak	---	---	
						Hickory	---	---	
ReA: Reddies	8A	Slight	Slight	Moderate	Severe	Yellow-poplar	105	115	Yellow-poplar, eastern white pine, black walnut.
						American sycamore	---	---	
						Red maple	---	---	
						Eastern white pine	---	---	
						River birch	---	---	
						Black birch	---	---	
						Black cherry	---	---	
						Eastern hemlock	---	---	
RhF[2]: Rock outcrop.									
Cataska	2R	Moderate	Severe	Severe	Moderate	Chestnut oak	40	26	Virginia pine.
						Scarlet oak	40	26	
						Pitch pine	---	---	
						Eastern white pine	---	---	
						Virginia pine	---	---	
						Hickory	---	---	
						Northern red oak	---	---	
						Sweet birch	---	---	
						Eastern hemlock	---	---	
RkF[2]: Rock outcrop.									
Cleveland	2R	Severe	Severe	Severe	Slight	Chestnut oak	40	26	
						Scarlet oak	---	---	
						Northern red oak	---	---	
						Eastern white pine	---	---	
						Eastern hemlock	---	---	
						Pitch pine	---	---	
						Virginia pine	---	---	
						Hickory	---	---	
						Sweet birch	---	---	
RsA: Rosman	8A	Slight	Slight	Slight	Severe	Yellow-poplar	105	115	Yellow-poplar, eastern white pine, black walnut.
						Eastern white pine	100	186	
						Northern red oak	---	---	
						American sycamore	---	---	
						Black walnut	---	---	
						Red maple	---	---	
						River birch	---	---	
						Black cherry	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume[1]	Trees to plant
SbC------------- Saunook	8A	Slight	Slight	Slight	Moderate	Yellow-poplar-------	107	119	Yellow-poplar, eastern white pine, northern red oak, Fraser fir[3].
						Eastern white pine--	---	---	
						Northern red oak----	---	---	
						White oak-----------	---	---	
						Scarlet oak---------	---	---	
						Eastern hemlock-----	---	---	
						Red maple-----------	---	---	
						Black cherry--------	---	---	
						American beech------	---	---	
						Sweet birch---------	---	---	
						Sugar maple---------	---	---	
						Yellow buckeye------	---	---	
SbD------------- Saunook	8R	Moderate	Moderate	Slight	Moderate	Yellow-poplar-------	107	---	Yellow-poplar, eastern white pine, northern red oak, Fraser fir[3].
						Eastern white pine--	---	---	
						Northern red oak----	---	---	
						White oak-----------	---	---	
						Scarlet oak---------	---	---	
						Eastern hemlock-----	---	---	
						Red maple-----------	---	---	
SbE------------- Saunook	8R	Severe	Severe	Slight	Moderate	Yellow-poplar-------	107	119	Yellow-poplar, eastern white pine, northern red oak, Fraser fir[3].
						Eastern white pine--	---	---	
						Northern red oak----	---	---	
						White oak-----------	---	---	
						Scarlet oak---------	---	---	
						Eastern hemlock-----	---	---	
						Red maple-----------	---	---	
						Black cherry--------	---	---	
						American beech------	---	---	
						Sweet birch---------	---	---	
						Sugar maple---------	---	---	
						Yellow buckeye------	---	---	
ScB, ScC-------- Saunook	8A	Slight	Slight	Slight	Moderate	Yellow-poplar-------	107	119	Yellow-poplar, eastern white pine, northern red oak, Fraser fir[3].
						Eastern white pine--	---	---	
						Northern red oak----	---	---	
						White oak-----------	---	---	
						Scarlet oak---------	---	---	
						Eastern hemlock-----	---	---	
						Red maple-----------	---	---	
						Black cherry--------	---	---	
						American beech------	---	---	
						Sweet birch---------	---	---	
						Sugar maple---------	---	---	
						Yellow buckeye------	---	---	
SoD[2]:									
Soco-----------	11R	Moderate	Moderate	Moderate	Moderate	Eastern white pine--	85	155	Eastern white pine.
						Shortleaf pine------	61	90	
						Pitch pine----------	---	---	
						Virginia pine-------	---	---	
						Chestnut oak--------	68	50	
						Scarlet oak---------	76	58	
						Northern red oak----	---	---	
						White oak-----------	---	---	
						Black oak-----------	---	---	
						Yellow-poplar-------	---	---	
						Scarlet oak---------	---	---	
						Hickory-------------	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume[1]	Trees to plant
SoD[2]:									
Stecoah	12R	Moderate	Moderate	Slight	Moderate	Eastern white pine	91	168	Eastern white pine.
						Shortleaf pine	---	---	
						Scarlet oak	---	---	
						White oak	82	164	
						Yellow-poplar	---	---	
						Chestnut oak	---	---	
						Virginia pine	---	---	
						Hickory	---	---	
						Black oak	---	---	
						Northern red oak	---	---	
						Pitch pine	---	---	
SoE[2], SoF[2]:									
Soco	11R	Severe	Severe	Moderate	Moderate	Eastern white pine	85	155	Eastern white pine.
						Shortleaf pine	61	90	
						Pitch pine	---	---	
						Virginia pine	---	---	
						Chestnut oak	68	50	
						Scarlet oak	76	58	
						Northern red oak	---	---	
						White oak	---	---	
						Black oak	---	---	
						Yellow-poplar	---	---	
						Scarlet oak	---	---	
						Hickory	---	---	
Stecoah	12R	Severe	Severe	Slight	Moderate	Eastern white pine	91	168	Eastern white pine, Fraser fir[3].
						Shortleaf pine	---	---	
						Scarlet oak	---	---	
						White oak	82	64	
						Yellow-poplar	---	---	
						Chestnut oak	---	---	
						Virginia pine	---	---	
						Hickory	---	---	
						Black oak	---	---	
						Northern red oak	---	---	
						Pitch pine	---	---	
SrC[2]:									
Spivey	8F	Slight	Slight	Slight	Severe	Yellow-poplar	100	102	Yellow-poplar, eastern white pine.
						Northern red oak	80	62	
						Eastern white pine	90	166	
						Black cherry	---	---	
						American beech	---	---	
						Sweet birch	---	---	
						Sugar maple	---	---	
						Yellow buckeye	---	---	
						Eastern hemlock	---	---	
Santeetlah	8A	Slight	Slight	Slight	Severe	Yellow-poplar	108	121	Northern red oak, black cherry, sugar maple, Fraser fir[3].
						Black cherry	---	---	
						Sugar maple	---	---	
						Eastern hemlock	---	---	
						Yellow buckeye	---	---	
						Yellow birch	---	---	
						Northern red oak	---	---	
						Black oak	---	---	
						White oak	---	---	
						American beech	---	---	
						Sweet birch	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume[1]	Trees to plant
SrD[2]:									
Spivey	8R	Moderate	Moderate	Slight	Severe	Yellow-poplar	100	102	Yellow-poplar, eastern white pine.
						Northern red oak	80	62	
						Eastern white pine	90	66	
						Black cherry	---	---	
						American beech	---	---	
						Sweet birch	---	---	
						Sugar maple	---	---	
						Yellow buckeye	---	---	
						Eastern hemlock	---	---	
Santeetlah	8R	Moderate	Moderate	Slight	Severe	Yellow-poplar	108	121	Northern red oak, black cherry, sugar maple, Fraser fir[3].
						Black cherry	---	---	
						Sugar maple	---	---	
						Eastern hemlock	---	---	
						Yellow buckeye	---	---	
						Yellow birch	---	---	
						Northern red oak	---	---	
						Black oak	---	---	
						White oak	---	---	
						American beech	---	---	
						Sweet birch	---	---	
SrE[2]:									
Spivey	8R	Severe	Severe	Slight	Severe	Yellow-poplar	100	107	Yellow-poplar, eastern white pine.
						Northern red oak	80	66	
						Eastern white pine	90	166	
						Black cherry	---	---	
						American birch	---	---	
						Black birch	---	---	
						Sugar maple	---	---	
						Yellow buckeye	---	---	
						Eastern hemlock	---	---	
Santeetlah	8R	Severe	Severe	Slight	Severe	Yellow-poplar	108	121	Northern red oak, black cherry, sugar maple, Fraser fir[3].
						Black cherry	---	---	
						Sugar maple	---	---	
						Eastern hemlock	---	---	
						Yellow buckeye	---	---	
						Yellow birch	---	---	
						Northern red oak	---	---	
						Black oak	---	---	
						White oak	---	---	
						American birch	---	---	
						Sweet birch	---	---	
StB Statler	8A	Slight	Slight	Slight	Severe	Yellow-poplar	100	107	Yellow-poplar, black walnut, eastern white pine.
						White oak	80	62	
						Eastern white pine	90	166	
						Red maple	---	---	
						Northern red oak	---	---	
						Hickory	---	---	
						Black cherry	---	---	
						American beech	---	---	
						Sweet birch	---	---	
						Yellow buckeye	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume[1]	Trees to plant
SxE[2]:									
Sylco	5R	Moderate	Severe	Moderate	Moderate	Shortleaf pine	50	68	Virginia pine.
						Virginia pine	50	68	
						Scarlet oak	---	---	
						Chestnut oak	---	---	
						Black oak	---	---	
						White oak	---	---	
						Eastern white pine	---	---	
						Pitch pine	---	---	
						Hickory	---	---	
Cataska	2R	Moderate	Severe	Severe	Moderate	Chestnut oak	40	26	Virginia pine.
						Scarlet oak	40	26	
						Pitch pine	40	---	
						Virginia pine	---	---	
						Hickory	---	---	
						Black oak	---	---	
						White oak	---	---	
						Eastern white pine	---	---	
						Shortleaf pine	---	---	
SyA[2]:									
Sylva	8W	Slight	Severe	Slight	Severe	Yellow-poplar	100	107	Yellow-poplar, eastern white pine.
						Eastern white pine	---	---	
						White oak	---	---	
						Red maple	---	---	
						Eastern hemlock	---	---	
						Sweet birch	---	---	
						Basswood	---	---	
Whiteside	12A	Slight	Slight	Slight	Severe	Eastern white pine	90	166	Eastern white pine, yellow-poplar, black cherry.
						Yellow-poplar	95	98	
						Black cherry	---	---	
						Eastern hemlock	---	---	
						Sugar maple	---	---	
						Red maple	---	---	
						White oak	---	---	
						Yellow birch	---	---	
						Sweet birch	---	---	
						Black locust	---	---	
						Basswood	---	---	
ToA: Toxaway	6W	Slight	Severe	Slight	Severe	Yellow-poplar	85	95	Yellow-poplar, eastern white pine, northern red oak.
						Eastern white pine	94	172	
						Virginia pine	---	---	
						Northern red oak	---	---	
						Shortleaf pine	---	---	
						American sycamore	---	---	
						Red maple	---	---	
						Yellow birch	---	---	
						Sweet birch	---	---	
						Eastern hemlock	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume[1]	Trees to plant
TrE, TrF-------- Trimont	8R	Severe	Severe	Slight	Moderate	Yellow-poplar-------	102	110	Yellow-poplar, northern red oak, black oak, white oak.
						Northern red oak----	---	---	
						Black oak-----------	---	---	
						White oak-----------	---	---	
						American beech------	---	---	
						Black locust--------	---	---	
						Red maple-----------	---	---	
						Black cherry--------	---	---	
						Sweet birch---------	---	---	
						Scarlet oak---------	---	---	
						Hickory-------------	---	---	
TsC[2]:									
Tuckasegee-----	8A	Slight	Slight	Slight	Severe	Yellow-poplar-------	109	122	Yellow-poplar, eastern white pine, northern red oak, black cherry, Fraser fir[3].
						Eastern white pine--	98	182	
						Northern red oak----	---	---	
						Black cherry--------	---	---	
						Eastern hemlock-----	---	---	
						White oak-----------	---	---	
						Yellow birch--------	---	---	
						American beech------	---	---	
						White ash-----------	---	---	
						Black locust--------	---	---	
						Yellow buckeye------	---	---	
						Sugar maple---------	---	---	
						Red maple-----------	---	---	
						Sweet birch---------	---	---	
Cullasaja------	8A	Slight	Slight	Slight	Severe	Yellow-poplar-------	109	122	Fraser fir[3].
						Black cherry--------	---	---	
						Northern red oak----	---	---	
						Yellow birch--------	---	---	
						Eastern white pine--	---	---	
						Yellow buckeye------	---	---	
						Eastern hemlock-----	---	---	
						American birch------	---	---	
						Sweet birch---------	---	---	
						Sugar maple---------	---	---	
TwB[2], TwC[2]:									
Tuckasegee-----	8A	Slight	Slight	Slight	Severe	Yellow-poplar-------	109	122	Yellow-poplar, eastern white pine, northern red oak, black cherry, Fraser fir[3].
						Eastern white pine--	98	182	
						Northern red oak----	---	---	
						Black cherry--------	---	---	
						Eastern hemlock-----	---	---	
						White oak-----------	---	---	
						Yellow birch--------	---	---	
						American beech------	---	---	
						White ash-----------	---	---	
						Black locust--------	---	---	
						Yellow buckeye------	---	---	
						Sugar maple---------	---	---	
						Red maple-----------	---	---	
						Sweet birch---------	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume[1]	Trees to plant
TwB[2], TwC[2]: Whiteside	12A	Slight	Slight	Slight	Severe	Eastern white pine	90	166	Eastern white pine, yellow-poplar, black cherry.
						Yellow-poplar	95	98	
						Black cherry	---	---	
						Eastern hemlock	---	---	
						Sugar maple	---	---	
						Red maple	---	---	
						White oak	---	---	
						Yellow birch	---	---	
						Sweet birch	---	---	
						Black locust	---	---	
						American beech	---	---	
						Northern red oak	---	---	
						Yellow buckeye	---	---	
WeC: Wayah	2A	Slight	Slight	Slight	Slight	Northern red oak	43	28	
						Red spruce	---	---	
						Fraser fir	---	---	
						Yellow birch	---	---	
						Sugar maple	---	---	
						Sweet birch	---	---	
WeD: Wayah	2R	Moderate	Moderate	Slight	Slight	Northern red oak	43	28	
						Red spruce	---	---	
						Fraser fir	---	---	
						Yellow birch	---	---	
						Sugar maple	---	---	
						Sweet birch	---	---	
WeE, WeF: Wayah	2R	Severe	Severe	Slight	Slight	Northern red oak	40	26	
						Red spruce	---	---	
						Fraser fir	---	---	
						Yellow birch	---	---	
						Sugar maple	---	---	
						Sweet birch	---	---	

[1] Volume is the yield in cubic feet per acre per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.
[2] See description of the map unit for composition and behavior characteristics of the map unit.
[3] Species is used for Christmas trees.
[4] Site index for this soil is estimated from data for Chestnut soils.
[5] Site index for this soil is estimated from data for Cowee soils.
[6] Site index for this soil is estimated from data for Nikwasi soils.

TABLE 8.--RECREATIONAL DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
ArA: Arkaqua	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Severe: flooding.
BeA: Biltmore	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
BkB2: Braddock	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
BkC2: Braddock	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
BrC*:					
Braddock	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Urban land.					
BrD*:					
Braddock	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Urban land.					
BsC*:					
Brasstown	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Junaluska	Moderate: slope.	Moderate: slope.	Severe: slope, small stones.	Slight	Moderate: small stones, slope, depth to rock.
BsD*:					
Brasstown	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Junaluska	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
BsE*, BsF*:					
Brasstown	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Junaluska	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
BuD*:					
Burton	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
BuD*:					
Craggey	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: large stones, depth to rock, slope.	Severe: fragile.	Severe: slope, depth to rock.
Rock outcrop.					
BuF*:					
Burton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Craggey	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: large stones, depth to rock, slope.	Severe: slope, fragile.	Severe: slope, depth to rock.
Rock outcrop.					
CaE, CaF: Cashiers	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
CcF*:					
Cataska	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Severe: small stones, slope.
Sylco	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones, slope.
CdD: Chandler	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
CdE, CdF: Chandler	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
ChE, ChF: Cheoah	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
CnC*:					
Chestnut	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, droughty, slope.
Edneyville	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.
CnD*:					
Chestnut	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
CnD*:					
Edneyville	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
CnE*:					
Chestnut	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Edneyville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
CpD*:					
Cleveland	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: slope, depth to rock.
Chestnut	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Rock outcrop.					
CpE*, CpF*:					
Cleveland	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
Chestnut	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Rock outcrop.					
CsD: Cullasaja	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope, small stones.	Severe: large stones.	Severe: small stones, large stones, slope.
CsE: Cullasaja	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope, small stones.	Severe: large stones, slope.	Severe: small stones, large stones, slope.
CuD*:					
Cullasaja	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Moderate: large stones, slope.	Severe: large stones, slope.
Tuckasegee	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
CuE*, CuF*:					
Cullasaja	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: large stones, slope.
Tuckasegee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
DgB: Dellwood	Severe: flooding.	Moderate: flooding, wetness.	Severe: small stones, flooding.	Moderate: flooding.	Severe: droughty, flooding.
DrB: Dillard	Severe: flooding.	Slight	Moderate: slope, wetness, percs slowly.	Slight	Slight.
DsB: Dillsboro	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: large stones.
DsC: Dillsboro	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: large stones, slope.
EdB*:					
Edneyville	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: droughty.
Chestnut	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones, droughty, depth to rock.
EdC*:					
Edneyville	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.
Chestnut	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, droughty, slope.
EdD*:					
Edneyville	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Chestnut	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
EdE*, EdF*:					
Edneyville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Chestnut	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
EeC*:					
Edneyville	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
EeC*:					
Chestnut	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, droughty, slope.
Urban land.					
EeD*:					
Edneyville	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Chestnut	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Urban land.					
EvB*:					
Evard	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
Cowee	Slight	Slight	Moderate: slope, small stones, depth to rock.	Slight	Moderate: small stones, depth to rock.
EvC*:					
Evard	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Cowee	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: small stones, slope, depth to rock.
EvD*:					
Evard	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Cowee	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
EvE*, EvF*:					
Evard	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Cowee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
ExC*:					
Evard	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Cowee	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: small stones, slope, depth to rock.
Urban land.					

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
ExD*:					
Evard	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Cowee	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Urban land.					
FaC Fannin	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: small stones, slope.
FaD Fannin	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
FaE, FaF Fannin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
HaB2 Hayesville	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
HaC2 Hayesville	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
HaD2 Hayesville	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
HmA Hemphill	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
NkA Nikwasi	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
OwE Oconaluftee	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
PwC Plott	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
PwD Plott	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
PwE, PwF Plott	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
ReA Reddies	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
RhF*:					
Rock outcrop.					
Cataska	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Severe: small stones, slope.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
RkF*:					
Rock outcrop.					
Cleveland	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
RsA: Rosman	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
SbC: Saunook	Moderate: slope.	Moderate: slope.	Severe: slope, small stones.	Slight	Moderate: small stones, slope.
SbD: Saunook	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
SbE: Saunook	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
ScB: Saunook	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
ScC: Saunook	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
SoD*:					
Soco	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Stecoah	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
SoE*, SoF*:					
Soco	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Stecoah	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
SrC*:					
Spivey	Severe: small stones.	Severe: small stones.	Severe: large stones, slope, small stones.	Moderate: large stones.	Severe: small stones.
Santeetlah	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
SrD*:					
Spivey	Severe: slope, small stones.	Severe: slope, small stones.	Severe: large stones, slope, small stones.	Moderate: large stones, slope.	Severe: small stones, slope.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
SrD*:					
Santeetlah	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
SrE*:					
Spivey	Severe: slope, small stones.	Severe: slope, small stones.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: small stones, slope.
Santeetlah	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
StB Statler	Severe: flooding.	Slight	Moderate: slope.	Slight	Slight.
SxE*:					
Sylco	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones, slope.
Cataska	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Severe: small stones, slope.
SyA*:					
Sylva	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Whiteside	Moderate: wetness.	Moderate: wetness.	Moderate: slope, small stones, wetness.	Moderate: wetness.	Moderate: wetness.
ToA Toxaway	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
TrE, TrF Trimont	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
TsC*:					
Tuckasegee	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: large stones, slope.
Cullasaja	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: large stones, slope, small stones.	Moderate: large stones.	Severe: large stones.
TwB*:					
Tuckasegee	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: large stones.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
TwB*:					
Whiteside	Moderate: wetness.	Moderate: wetness.	Moderate: slope, small stones, wetness.	Moderate: wetness.	Moderate: wetness.
TwC*:					
Tuckasegee	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: large stones, slope.
Whiteside	Moderate: slope, wetness.	Moderate: slope, wetness.	Severe: slope.	Moderate: wetness.	Moderate: wetness.
Ud. Udorthents					
UfB*: Udorthents.					
Urban land.					
WeC Wayah	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
WeD Wayah	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
WeE, WeF Wayah	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--WILDLIFE HABITAT

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
ArA---------------- Arkaqua	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
BeA---------------- Biltmore	Poor	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BkB2--------------- Braddock	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BkC2--------------- Braddock	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BrC*:										
Braddock-----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land.										
BrD*:										
Braddock-----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Urban land.										
BsC*:										
Brasstown----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Junaluska----------	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
BsD*:										
Brasstown----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Junaluska----------	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
BsE*, BsF*:										
Brasstown----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Junaluska----------	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
BuD*:										
Burton-------------	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Craggey------------	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Fair	Very poor.
Rock outcrop.										

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
BuF*:										
Burton	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Craggey	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Fair	Very poor.
Rock outcrop.										
CaE, CaF Cashiers	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
CcF*:										
Cataska	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
Sylco	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
CdD Chandler	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
CdE, CdF Chandler	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
ChE, ChF Cheoah	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
CnC*:										
Chestnut	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Edneyville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CnD*:										
Chestnut	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Edneyville	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
CnE*:										
Chestnut	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Edneyville	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
CpD*:										
Cleveland	Very poor.	Very poor.	Poor	Fair	Fair	Very poor.	Very poor.	Very poor.	Poor	Very poor.
Chestnut	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Rock outcrop.										

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
CpE*, CpF*:										
Cleveland	Very poor.	Very poor.	Poor	Fair	Fair	Very poor.	Very poor.	Very poor.	Poor	Very poor.
Chestnut	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Rock outcrop.										
CsD, CsE Cullasaja	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
CuD*:										
Cullasaja	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Tuckasegee	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
CuE*, CuF*:										
Cullasaja	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Tuckasegee	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
DgB Dellwood	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
DrB Dillard	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
DsB Dillsboro	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
DsC Dillsboro	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
EdB*, EdC*:										
Edneyville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Chestnut	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
EdD*:										
Edneyville	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Chestnut	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
EdE*, EdF*:										
Edneyville	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Chestnut	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
EeC*:										
Edneyville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Chestnut	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Urban land.										
EeD*:										
Edneyville	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Chestnut	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Urban land.										
EvB*, EvC*:										
Evard	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Cowee	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
EvD*:										
Evard	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Cowee	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
EvE*, EvF*:										
Evard	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Cowee	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
ExC*:										
Evard	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Cowee	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Urban land.										
ExD*:										
Evard	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Cowee	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Urban land.										
FaC Fannin	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Conif-erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
FaD----------------- Fannin	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
FaE, FaF----------- Fannin	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
HaB2---------------- Hayesville	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
HaC2---------------- Hayesville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
HaD2---------------- Hayesville	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
HmA----------------- Hemphill	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
NkA----------------- Nikwasi	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
OwE----------------- Oconaluftee	Very poor.	Poor	Good	Very poor.	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
PwC----------------- Plott	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
PwD----------------- Plott	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
PwE, PwF----------- Plott	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
ReA----------------- Reddies	Poor	Fair	Fair	Good	Good	Poor	Poor	Fair	Good	Poor.
RhF*: Rock outcrop.										
Cataska-----------	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
RkF*: Rock outcrop.										
Cleveland---------	Very poor.	Very poor.	Poor	Fair	Fair	Very poor.	Very poor.	Very poor.	Poor	Very poor.
RsA----------------- Rosman	Good	Good	Good	Good	Good	Fair	Very poor.	Good	Good	Very poor.
SbC----------------- Saunook	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
SbD----------------- Saunook	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
SbE----------------- Saunook	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
ScB----------------- Saunook	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
ScC----------------- Saunook	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
SoD*:										
Soco---------------	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Stecoah------------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
SoE*, SoF*:										
Soco---------------	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Stecoah------------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
SrC*:										
Spivey-------------	Very poor.	Very poor.	Fair	Good	Poor	Very poor.	Very poor.	Poor	Fair	Very poor.
Santeetlah---------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
SrD*:										
Spivey-------------	Very poor.	Very poor.	Fair	Good	Poor	Very poor.	Very poor.	Poor	Fair	Very poor.
Santeetlah---------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
SrE*:										
Spivey-------------	Very poor.	Very poor.	Fair	Good	Poor	Very poor.	Very poor.	Poor	Fair	Very poor.
Santeetlah---------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
StB----------------- Statler	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SxE*:										
Sylco--------------	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Cataska------------	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
SyA*:										
Sylva--------------	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Whiteside----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
ToA----------------- Toxaway	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
TrE, TrF----------- Trimont	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
TsC*:										
Tuckasegee--------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Cullasaja---------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
TwB*:										
Tuckasegee--------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Whiteside---------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
TwC*:										
Tuckasegee--------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Whiteside---------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Ud. Udorthents										
UfB*:										
Udorthents.										
Urban land.										
WeC--------------- Wayah	Fair	Good	Good	Very poor.	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
WeD--------------- Wayah	Poor	Fair	Good	Very poor.	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
WeE, WeF----------- Wayah	Very poor.	Poor	Good	Very poor.	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
ArA---------------- Arkaqua	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding.	Severe: flooding.
BeA---------------- Biltmore	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
BkB2--------------- Braddock	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
BkC2--------------- Braddock	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
BrC*:						
Braddock----------	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
Urban land.						
BrD*:						
Braddock----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Urban land.						
BsC*:						
Brasstown---------	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: slope.
Junaluska---------	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: small stones, slope, depth to rock.
BsD*, BsE*, BsF*:						
Brasstown---------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Junaluska---------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BuD*, BuF*:						
Burton------------	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Craggey-----------	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
BuD*, BuF*:						
Rock outcrop.						
CaE, CaF----------Cashiers	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.	Severe: slope.
CcF*:						
Cataska----------	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
Sylco------------	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
CdD, CdE, CdF-----Chandler	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.	Severe: slope.
ChE, ChF----------Cheoah	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
CnC*:						
Chestnut---------	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, droughty, slope.
Edneyville-------	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: droughty, slope.
CnD*, CnE*:						
Chestnut---------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Edneyville-------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
CpD*, CpE*, CpF*:						
Cleveland--------	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Chestnut---------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.						
CsD, CsE----------Cullasaja	Severe: cutbanks cave, large stones, slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: small stones, large stones, slope.
CuD*, CuE*, CuF*:						
Cullasaja--------	Severe: cutbanks cave, large stones, slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
CuD*, CuE*, CuF*:						
Tuckasegee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
DgB: Dellwood	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Severe: droughty, flooding.
DrB: Dillard	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: low strength, wetness.	Slight.
DsB: Dillsboro	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: large stones.
DsC: Dillsboro	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: large stones, slope.
EdB*:						
Edneyville	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Moderate: droughty.
Chestnut	Moderate: depth to rock.	Slight	Moderate: depth to rock.	Moderate: slope.	Moderate: frost action.	Moderate: small stones, droughty, depth to rock.
EdC*:						
Edneyville	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: droughty, slope.
Chestnut	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, droughty, slope.
EdD*, EdE*, EdF*:						
Edneyville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Chestnut	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
EeC*:						
Edneyville	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: droughty, slope.
Chestnut	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, droughty, slope.
Urban land.						
EeD*:						
Edneyville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
EeD*:						
Chestnut	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Urban land.						
EvB*:						
Evard	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
Cowee	Moderate: depth to rock.	Slight	Moderate: depth to rock.	Moderate: slope.	Moderate: frost action.	Moderate: small stones, depth to rock.
EvC*:						
Evard	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
Cowee	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, slope, depth to rock.
EvD*, EvE*, EvF*:						
Evard	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Cowee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
ExC*:						
Evard	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
Cowee	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, slope, depth to rock.
Urban land.						
ExD*:						
Evard	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Cowee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Urban land.						
FaC Fannin	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: small stones, slope.
FaD, FaE, FaF Fannin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
HaB2: Hayesville	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Moderate: low strength, frost action.	Slight.
HaC2: Hayesville	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: slope.
HaD2: Hayesville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
HmA: Hemphill	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.
NkA: Nikwasi	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
OwE: Oconaluftee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
PwC: Plott	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
PwD, PwE, PwF: Plott	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
ReA: Reddies	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.
RhF*: Rock outcrop.						
Cataska	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
RkF*: Rock outcrop.						
Cleveland	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
RsA: Rosman	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
SbC: Saunook	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: small stones, slope.
SbD, SbE: Saunook	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
ScB: Saunook	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength, frost action.	Slight.
ScC: Saunook	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: slope.
SoD*, SoE*, SoF*:						
Soco	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Stecoah	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SrC*:						
Spivey	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Moderate: large stones.	Severe: large stones.
Santeetlah	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
SrD*, SrE*:						
Spivey	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope.
Santeetlah	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
StB: Statler	Slight	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Slight.
SxE*:						
Sylco	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
Cataska	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
SyA*:						
Sylva	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
Whiteside	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, frost action.	Moderate: wetness.
ToA: Toxaway	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
TrE, TrF: Trimont	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
TsC*:						
Tuckasegee	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: large stones, slope.
Cullasaja	Severe: cutbanks cave, large stones.	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.
TwB*:						
Tuckasegee	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Moderate: large stones.
Whiteside	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: wetness, frost action.	Moderate: wetness.
TwC*:						
Tuckasegee	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: large stones, slope.
Whiteside	Severe: cutbanks cave, wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Moderate: wetness, slope, frost action.	Moderate: wetness.
Ud. Udorthents						
UfB*:						
Udorthents.						
Urban land.						
WeC Wayah	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
WeD, WeE, WeF Wayah	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "poor," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
ArA: Arkaqua	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
BeA: Biltmore	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage.	Poor: seepage, too sandy.
BkB2: Braddock	Moderate: percs slowly.	Severe: seepage.	Severe: seepage, too clayey.	Slight	Poor: too clayey, hard to pack.
BkC2: Braddock	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage, too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
BrC*:					
Braddock	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage, too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
Urban land.					
BrD*:					
Braddock	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
Urban land.					
BsC*:					
Brasstown	Moderate: depth to rock, percs slowly, slope.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock, slope.	Fair: depth to rock, small stones, slope.
Junaluska	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
BsD*, BsE*, BsF*:					
Brasstown	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: slope.
Junaluska	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
BuD*, BuF*:					
Burton	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, slope.
Craggey	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
Rock outcrop.					
CaE, CaF: Cashiers	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
CcF*:					
Cataska	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, seepage.	Poor: depth to rock, seepage, small stones.
Sylco	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
CdD, CdE, CdF: Chandler	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: hard to pack, slope.
ChE, ChF: Cheoah	Severe: slope.	Severe: seepage, slope.	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: slope.
CnC*:					
Chestnut	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
Edneyville	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: small stones, slope.
CnD*, CnE*:					
Chestnut	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
Edneyville	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
CpD*, CpE*, CpF*:					
Cleveland	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
Chestnut	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
Rock outcrop.					
CsD, CsE: Cullasaja	Severe: slope, large stones.	Severe: seepage, slope, large stones.	Severe: seepage, slope, large stones.	Severe: seepage, slope.	Poor: seepage, large stones, slope.
CuD*, CuE*, CuF*:					
Cullasaja	Severe: slope, large stones.	Severe: seepage, slope, large stones.	Severe: seepage, slope, large stones.	Severe: seepage, slope.	Poor: seepage, large stones, slope.
Tuckasegee	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: slope, seepage.	Poor: large stones, slope.
DgB: Dellwood	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, small stones.
DrB: Dillard	Severe: wetness, percs slowly.	Severe: wetness, flooding.	Severe: wetness, too clayey.	Severe: wetness.	Fair: too clayey.
DsB: Dillsboro	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
DsC: Dillsboro	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
EdB*:					
Edneyville	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: small stones.
Chestnut	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
EdC*:					
Edneyville	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: small stones, slope.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
EdC*:					
Chestnut	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
EdD*, EdE*, EdF*:					
Edneyville	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Chestnut	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
EeC*:					
Edneyville	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: small stones, slope.
Chestnut	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
Urban land.					
EeD*:					
Edneyville	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Chestnut	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
Urban land.					
EvB*:					
Evard	Slight	Moderate: seepage, slope.	Moderate: too sandy.	Slight	Fair: too sandy, small stones.
Cowee	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock.
EvC*:					
Evard	Moderate: slope.	Severe: slope.	Moderate: slope, too sandy.	Moderate: slope.	Fair: too sandy, small stones, slope.
Cowee	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock.
EvD*, EvE*, EvF*:					
Evard	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
EvD*, EvE*, EvF*:					
Cowee	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
ExC*:					
Evard	Moderate: slope.	Severe: slope.	Moderate: slope, too sandy.	Moderate: slope.	Fair: too sandy, small stones, slope.
Cowee	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock.
Urban land.					
ExD*:					
Evard	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Cowee	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
Urban land.					
FaC Fannin	Moderate: slope, percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: small stones, slope.
FaD, FaE, FaF Fannin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
HaB2 Hayesville	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Slight	Fair: too clayey, hard to pack.
HaC2 Hayesville	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
HaD2 Hayesville	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: slope.	Poor: slope.
HmA Hemphill	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
NkA Nikwasi	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, small stones.
OwE Oconaluftee	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
PwC----------------- Plott	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope, thin layer.
PwD, PwE, PwF------- Plott	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
ReA----------------- Reddies	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, small stones.
RhF*: Rock outcrop.					
Cataska------------	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, seepage.	Severe: depth to rock, slope, seepage.	Poor: depth to rock, seepage, small stones.
RkF*: Rock outcrop.					
Cleveland----------	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
RsA----------------- Rosman	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Fair: wetness.
SbC----------------- Saunook	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: small stones.
SbD, SbE------------ Saunook	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.
ScB----------------- Saunook	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: small stones.
ScC----------------- Saunook	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: small stones.
SoD*, SoE*, SoF*: Soco---------------	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, slope.
Stecoah------------	Severe: slope.	Severe: seepage, slope.	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
SrC*:					
Spivey	Severe: large stones.	Severe: seepage, slope, large stones.	Severe: seepage, large stones.	Severe: seepage.	Poor: seepage, small stones.
Santeetlah	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope.
SrD*, SrE*:					
Spivey	Severe: slope, large stones.	Severe: seepage, slope, large stones.	Severe: seepage, slope, large stones.	Severe: seepage, slope.	Poor: seepage, large stones, slope.
Santeetlah	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
StB Statler	Moderate: flooding, percs slowly.	Severe: seepage.	Severe: seepage.	Moderate: flooding.	Good.
SxE*:					
Sylco	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
Cataska	Severe: depth to rock, slope.	Severe: depth to rock, slope, seepage.	Severe: depth to rock, slope, seepage.	Severe: depth to rock, slope, seepage.	Poor: depth to rock, seepage, small stones.
SyA*:					
Sylva	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
Whiteside	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: wetness.
ToA Toxaway	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: hard to pack, wetness.
TrE, TrF Trimont	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
TsC*:					
Tuckasegee	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: large stones.
Cullasaja	Severe: large stones.	Severe: seepage, slope, large stones.	Severe: seepage, large stones.	Severe: seepage.	Poor: seepage, large stones.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
TwB*:					
Tuckasegee	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: large stones.
Whiteside	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: wetness.
TwC*:					
Tuckasegee	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: large stones.
Whiteside	Severe: wetness.	Severe: seepage, slope, wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: slope, wetness.
Ud. Udorthents					
UfB*:					
Udorthents.					
Urban land.					
WeC Wayah	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: small stones.
WeD, WeE, WeF Wayah	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--CONSTRUCTION MATERIALS

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
ArA: Arkaqua	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
BeA: Biltmore	Good	Probable	Improbable: too sandy.	Poor: too sandy.
BkB2, BkC2: Braddock	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, area reclaim, small stones.
BrC*:				
Braddock	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, area reclaim, small stones.
Urban land.				
BrD*:				
Braddock	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, area reclaim, small stones.
Urban land.				
BsC*:				
Brasstown	Fair: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Junaluska	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
BsD*:				
Brasstown	Fair: depth to rock, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Junaluska	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
BsE*, BsF*:				
Brasstown	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Junaluska	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
BuD*:				
Burton	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Craggey	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, large stones, slope.
Rock outcrop.				
BuF*:				
Burton	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Craggey	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, large stones, slope.
Rock outcrop.				
CaE, CaF: Cashiers	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
CcF*:				
Cataska	Poor: depth to rock, slope.	Improbable: small stones.	Improbable: thin layer.	Poor: depth to rock, small stones, slope.
Sylco	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
CdD: Chandler	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
CdE, CdF: Chandler	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
ChE, ChF: Cheoah	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
CnC*:				
Chestnut	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones.
Edneyville	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
CnD*:				
Chestnut	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones, slope.
Edneyville	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
CnE*:				
Chestnut	Poor: depth to rock, slope.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones, slope.
Edneyville	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
CpD*:				
Cleveland	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Chestnut	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones, slope.
Rock outcrop.				
CpE*, CpF*:				
Cleveland	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Chestnut	Poor: depth to rock, slope.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones, slope.
Rock outcrop.				
CsD Cullasaja	Poor: large stones.	Improbable: large stones.	Improbable: large stones.	Poor: large stones, area reclaim, slope.
CsE Cullasaja	Poor: large stones, slope.	Improbable: large stones.	Improbable: large stones.	Poor: large stones, area reclaim, slope.
CuD*:				
Cullasaja	Poor: large stones.	Improbable: large stones.	Improbable: large stones.	Poor: large stones, area reclaim, slope.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
CuD*:				
Tuckasegee	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
CuE*, CuF*:				
Cullasaja	Poor: large stones, slope.	Improbable: large stones.	Improbable: large stones.	Poor: large stones, area reclaim, slope.
Tuckasegee	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
DgB Dellwood	Fair: large stones, wetness.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
DrB Dillard	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
DsB, DsC Dillsboro	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, area reclaim.
EdB*, EdC*:				
Edneyville	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Chestnut	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones.
EdD*:				
Edneyville	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Chestnut	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones, slope.
EdE*, EdF*:				
Edneyville	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Chestnut	Poor: depth to rock, slope.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones, slope.
EeC*:				
Edneyville	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
EeC*:				
Chestnut	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones.
Urban land.				
EeD*:				
Edneyville	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Chestnut	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones, slope.
Urban land.				
EvB*:				
Evard	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Cowee	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
EvC*:				
Evard	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
Cowee	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
EvD*:				
Evard	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Cowee	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
EvE*, EvF*:				
Evard	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Cowee	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
ExC*:				
Evard	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
Cowee	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Urban land.				

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
ExD*:				
Evard	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Cowee	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Urban land.				
FaC Fannin	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
FaD Fannin	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
FaE, FaF Fannin	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
HaB2, HaC2 Hayesville	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
HaD2 Hayesville	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
HmA Hemphill	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
NkA Nikwasi	Poor: wetness.	Probable	Probable	Poor: small stones, area reclaim, wetness.
OwE Oconaluftee	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
PwC Plott	Good	Probable	Probable	Fair: small stones, area reclaim, slope.
PwD Plott	Fair: slope.	Probable	Probable	Poor: slope.
PwE, PwF Plott	Poor: slope.	Probable	Probable	Poor: slope.
ReA Reddies	Fair: wetness.	Probable	Probable	Poor: small stones, area reclaim.
RhF*:				
Rock outcrop.				

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
RhF*:				
Cataska	Poor: depth to rock, slope.	Improbable: small stones.	Improbable: thin layer.	Poor: depth to rock, small stones, slope.
RkF*: Rock outcrop.				
Cleveland	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
RsA Rosman	Fair: wetness.	Probable	Probable	Fair: small stones, area reclaim.
SbC Saunook	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
SbD Saunook	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
SbE Saunook	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
ScB, ScC Saunook	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
SoD*:				
Soco	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Stecoah	Fair: depth to rock, thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
SoE*, SoF*:				
Soco	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Stecoah	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
SrC*:				
Spivey	Fair: large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
SrC*:				
Santeetlah	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
SrD*:				
Spivey	Poor: large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: large stones, area reclaim, slope.
Santeetlah	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
SrE*:				
Spivey	Poor: slope, large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: small stones, area reclaim, slope.
Santeetlah	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
StB Statler	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
SxE*:				
Sylco	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Cataska	Poor: depth to rock, slope.	Improbable: small stones, thin layer.	Improbable: thin layer.	Poor: depth to rock, small stones, slope.
SyA*:				
Sylva	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Whiteside	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
ToA Toxaway	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
TrE, TrF Trimont	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
TsC*:				
Tuckasegee	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
TsC*:				
Cullasaja	Poor: large stones.	Improbable: large stones.	Improbable: large stones.	Poor: large stones, area reclaim.
TwB*:				
Tuckasegee	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Whiteside	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
TwC*:				
Tuckasegee	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Whiteside	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
Ud. Udorthents				
UfB*: Udorthents.				
Urban land.				
WeC Wayah	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
WeD Wayah	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
WeE, WeF Wayah	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--WATER MANAGEMENT

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
ArA-------------- Arkaqua	Moderate: seepage.	Severe: wetness.	Flooding-------	Wetness, flooding.	Wetness--------	Favorable.
BeA-------------- Biltmore	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, soil blowing, flooding.	Too sandy, soil blowing.	Droughty.
BkB2------------- Braddock	Severe: seepage.	Moderate: hard to pack.	Deep to water	Slope----------	Favorable------	Favorable.
BkC2------------- Braddock	Severe: seepage, slope.	Moderate: hard to pack.	Deep to water	Slope----------	Slope----------	Slope.
BrC*, BrD*:						
Braddock---------	Severe: seepage, slope.	Moderate: hard to pack.	Deep to water	Slope----------	Slope----------	Slope.
Urban land.						
BsC*, BsD*, BsE*, BsF*:						
Brasstown-------	Severe: slope.	Severe: piping.	Deep to water	Slope----------	Slope----------	Slope.
Junaluska-------	Severe: seepage, slope.	Severe: thin layer.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
BuD*, BuF*:						
Burton-----------	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
Craggey----------	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, large stones, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
Rock outcrop.						
CaE, CaF---------- Cashiers	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, soil blowing.	Slope, soil blowing.	Slope.
CcF*:						
Cataska----------	Severe: depth to rock, slope.	Severe: seepage, thin layer.	Deep to water	Slope, droughty, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Sylco------------	Severe: slope.	Severe: piping.	Deep to water	Slope, droughty, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, droughty.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
CdD, CdE, CdF: Chandler	Severe: seepage, slope.	Severe: piping, hard to pack.	Deep to water	Slope, soil blowing.	Slope, soil blowing.	Slope.
ChE, ChF: Cheoah	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope	Slope	Slope.
CnC*, CnD*, CnE*:						
Chestnut	Severe: seepage, slope.	Severe: piping, thin layer.	Deep to water	Slope, droughty, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
Edneyville	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, droughty.	Slope	Slope, droughty.
CpD*, CpE*, CpF*:						
Cleveland	Severe: depth to rock, slope.	Severe: piping.	Deep to water	Slope, droughty.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Chestnut	Severe: seepage, slope.	Severe: piping, thin layer.	Deep to water	Slope, droughty, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
Rock outcrop.						
CsD, CsE: Cullasaja	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Slope, large stones, droughty.	Slope, large stones, too sandy.	Large stones, slope, droughty.
CuD*, CuE*, CuF*:						
Cullasaja	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Slope, large stones, droughty.	Slope, large stones, too sandy.	Large stones, slope, droughty.
Tuckasegee	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, soil blowing.	Slope, large stones, soil blowing.	Large stones, slope.
DgB: Dellwood	Severe: seepage.	Severe: seepage, large stones.	Flooding, large stones.	Large stones, wetness, droughty.	Large stones, wetness, too sandy.	Large stones, droughty.
DrB: Dillard	Slight	Moderate: thin layer, wetness.	Slope	Slope, wetness, soil blowing.	Wetness, soil blowing.	Favorable.
DsB: Dillsboro	Moderate: seepage, slope.	Severe: hard to pack.	Deep to water	Slope, soil blowing.	Soil blowing	Favorable.
DsC: Dillsboro	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, soil blowing.	Slope, soil blowing.	Slope.
EdB*:						
Edneyville	Severe: seepage.	Severe: piping.	Deep to water	Slope, droughty.	Favorable	Droughty.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
EdB*:						
Chestnut	Severe: seepage.	Severe: piping, thin layer.	Deep to water	Slope, droughty, depth to rock.	Large stones, depth to rock.	Large stones, depth to rock.
EdC*, EdD*, EdE*, EdF*:						
Edneyville	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, droughty.	Slope	Slope, droughty.
Chestnut	Severe: seepage, slope.	Severe: piping, thin layer.	Deep to water	Slope, droughty, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
EeC*, EeD*:						
Edneyville	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, droughty.	Slope	Slope, droughty.
Chestnut	Severe: seepage, slope.	Severe: piping, thin layer.	Deep to water	Slope, droughty, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
Urban land.						
EvB*:						
Evard	Moderate: seepage, slope.	Severe: seepage, piping.	Deep to water	Slope, soil blowing.	Too sandy, soil blowing.	Favorable.
Cowee	Moderate: seepage, depth to rock, slope.	Severe: thin layer, piping.	Deep to water	Slope, depth to rock.	Depth to rock	Depth to rock.
EvC*, EvD*, EvE*, EvF*:						
Evard	Severe: slope.	Severe: seepage, piping.	Deep to water	Slope, soil blowing.	Slope, too sandy, soil blowing.	Slope.
Cowee	Severe: slope.	Severe: thin layer, piping.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
ExC*, ExD*:						
Evard	Severe: slope.	Severe: seepage, piping.	Deep to water	Slope, soil blowing.	Slope, too sandy, soil blowing.	Slope.
Cowee	Severe: slope.	Severe: thin layer, piping.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
Urban land.						
FaC, FaD, FaE, FaF Fannin	Severe: slope.	Severe: piping.	Deep to water	Slope	Slope	Slope.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
HaB2---------------- Hayesville	Severe: seepage.	Severe: hard to pack.	Deep to water	Slope----------	Favorable------	Favorable.
HaC2, HaD2--------- Hayesville	Severe: seepage, slope.	Severe: hard to pack.	Deep to water	Slope----------	Slope----------	Slope.
HmA---------------- Hemphill	Slight---------	Severe: hard to pack, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
NkA---------------- Nikwasi	Severe: seepage.	Severe: seepage, wetness.	Flooding, large stones, cutbanks cave.	Wetness, droughty, flooding.	Large stones, wetness, too sandy.	Large stones, wetness, droughty.
OwE---------------- Oconaluftee	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope----------	Slope----------	Slope.
PwC, PwD, PwE, PwF--------------- Plott	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope----------	Slope----------	Slope.
ReA---------------- Reddies	Severe: seepage.	Severe: seepage.	Flooding, large stones, cutbanks cave.	Wetness, droughty.	Large stones, wetness, too sandy.	Large stones, droughty.
RhF*: Rock outcrop.						
Cataska-----------	Severe: depth to rock, slope.	Severe: seepage, thin layer.	Deep to water	Slope, droughty, percs slowly.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
RkF*: Rock outcrop.						
Cleveland---------	Severe: depth to rock, slope.	Severe: piping.	Deep to water	Slope, droughty.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
RsA---------------- Rosman	Severe: seepage.	Severe: piping.	Flooding-------	Wetness, soil blowing, flooding.	Wetness, soil blowing.	Favorable.
SbC, SbD, SbE----- Saunook	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope----------	Slope----------	Slope.
ScB---------------- Saunook	Severe: seepage.	Severe: piping.	Deep to water	Slope----------	Favorable------	Favorable.
ScC---------------- Saunook	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope----------	Slope----------	Slope.
SoD*, SoE*, SoF*: Soco--------------	Severe: seepage, slope.	Severe: piping, thin layer.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
SoD*, SoE*, SoF*:						
Stecoah	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope	Slope	Slope.
SrC*, SrD*, SrE*:						
Spivey	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Slope, large stones, droughty.	Slope, large stones.	Large stones, slope, droughty.
Santeetlah	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope	Slope	Slope.
StB Statler	Severe: seepage.	Severe: piping.	Deep to water	Slope	Favorable	Favorable.
SxE*:						
Sylco	Severe: slope.	Severe: piping.	Deep to water	Slope, droughty, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Cataska	Severe: depth to rock, slope.	Severe: seepage, thin layer.	Deep to water	Slope, droughty, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
SyA*:						
Sylva	Severe: seepage.	Severe: piping, wetness.	Frost action	Wetness	Wetness	Wetness.
Whiteside	Severe: seepage.	Severe: piping, wetness.	Favorable	Wetness	Wetness	Favorable.
ToA Toxaway	Moderate: seepage.	Severe: piping, hard to pack, wetness.	Flooding, frost action.	Wetness, flooding.	Wetness	Wetness.
TrE, TrF Trimont	Severe: slope.	Severe: piping.	Deep to water	Slope	Slope	Slope.
TsC*:						
Tuckasegee	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, soil blowing.	Slope, large stones, soil blowing.	Large stones, slope.
Cullasaja	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Slope, large stones, droughty.	Slope, large stones, too sandy.	Large stones, slope, droughty.
TwB*:						
Tuckasegee	Severe: seepage.	Severe: piping.	Deep to water	Slope, soil blowing.	Large stones, soil blowing.	Large stones.
Whiteside	Severe: seepage.	Severe: piping, wetness.	Slope	Slope, wetness.	Wetness	Favorable.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
TwC*:						
Tuckasegee	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, soil blowing.	Slope, large stones, soil blowing.	Large stones, slope.
Whiteside	Severe: seepage, slope.	Severe: piping, wetness.	Slope	Slope, wetness.	Slope, wetness.	Slope.
Ud. Udorthents						
UfB*:						
Udorthents.						
Urban land.						
WeC, WeD, WeE, WeF Wayah	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope	Slope	Slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--ENGINEERING INDEX PROPERTIES

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
ArA----------- Arkaqua	0-10	Loam----------	SM	A-2, A-4	0	98-100	95-100	60-90	30-50	25-35	NP-7
	10-48	Clay loam, loam, fine sandy loam.	ML, MH	A-4, A-5, A-6, A-7	0	96-100	95-100	80-100	51-90	35-55	4-20
	48-60	Variable------	---	---	---	---	---	---	---	---	---
BeA----------- Biltmore	0-12	Sandy loam----	SM	A-2-4, A-4	0-5	95-100	90-100	60-95	20-49	22-30	NP-4
	12-60	Loamy sand, sand, loamy fine sand.	SM, SP-SM	A-2-4	0-8	95-100	85-100	55-96	10-35	<20	NP
BkB2, BkC2---- Braddock	0-11	Clay loam-----	CL	A-6, A-7	0-5	80-100	75-100	65-95	50-85	35-50	15-26
	11-57	Clay loam, gravelly clay, sandy clay.	CH, CL, SC, GC	A-7	0-15	80-100	65-100	55-95	40-90	42-66	15-35
	57-60	Loam, very cobbly sandy clay loam.	SC, CL, GM, MH	A-2, A-4, A-6, A-7	0-50	75-95	30-90	25-85	20-70	25-50	8-28
BrC*, BrD*:											
Braddock-----	0-11	Clay loam-----	CL	A-6, A-7	0-5	80-100	75-100	65-95	50-85	35-50	15-26
	11-57	Clay loam, gravelly clay, sandy clay.	CH, CL, SC, MH	A-7	0-15	80-100	65-100	55-95	40-90	42-66	15-35
	57-60	Loam, very cobbly sandy clay loam.	SC, CL, GM, GC	A-2, A-4, A-6, A-7	0-50	75-95	30-90	25-85	20-70	25-50	8-28
Urban land.											
BsC*, BsD*, BsE*, BsF*:											
Brasstown---	0-6	Loam----------	SM, ML, MH	A-4, A-5, A-7-5	0-5	85-100	80-100	65-95	35-60	30-57	NP-14
	6-36	Channery loam, channery clay loam, loam.	CL, ML, SC, SM	A-6, A-7-6	2-15	75-100	70-100	55-97	40-73	35-50	11-20
	36-45	Channery fine sandy loam, channery very fine sandy loam, loam.	SM, GM, ML	A-4	2-15	70-100	70-100	40-96	35-55	25-35	NP-10
	45-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments >3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
BsC*, BsD*, BsE*, BsF*:											
Junaluska---	0-5	Channery fine sandy loam.	SM, ML, MH, GM	A-4, A-5, A-2-4, A-7	5-15	70-96	55-91	40-80	30-55	29-56	NP-14
	5-21	Channery loam, channery clay loam, sandy clay loam.	CL, ML, SC, SM	A-6, A-7	5-15	75-100	60-100	55-95	40-73	29-50	10-20
	21-36	Channery loam, channery fine sandy loam, flaggy fine sandy loam.	SM, ML, GM	A-4	5-15	70-100	55-100	40-91	35-55	25-40	3-10
	36-45	Weathered bedrock.	---	---	---	---	---	---	---	---	---
BuD*, BuF*:											
Burton-------	0-18	Sandy loam----	SM	A-2, A-4, A-5	0-15	80-100	80-100	60-90	30-49	30-50	NP-7
	18-36	Very cobbly fine sandy loam, stony sandy loam, cobbly sandy loam.	SM, GM, SP-SM, GM-GC	A-2, A-1-b	10-35	45-75	40-65	35-55	10-30	25-35	NP-7
	36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Craggey------	0-17	Cobbly sandy loam.	SM, SC-SM	A-2, A-4, A-5	15-35	80-95	75-95	60-90	25-49	<50	NP-7
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
CaE, CaF------ Cashiers	0-8	Gravelly fine sandy loam.	SM, SC-SM	A-2-4, A-4, A-1, A-5	5-15	70-85	60-75	30-65	20-50	<50	NP-7
	8-49	Sandy loam, fine sandy loam, gravelly sandy loam.	SM, ML, SC-SM, CL-ML	A-2-4, A-4	0-5	70-95	60-95	50-85	25-65	<35	NP-7
	49-60	Gravelly sandy loam, gravelly fine sandy loam, sandy loam.	SM, SC-SM	A-2-4, A-4, A-1-b	0-15	70-95	60-95	30-75	20-50	<35	NP-7
CcF*:											
Cataska------	0-6	Very channery loam.	GM-GC, GM	A-2, A-4, A-1	15-25	45-75	40-70	35-65	25-50	<30	NP-6
	6-16	Channery silt loam, very channery loam.	GM-GC, GM, GP-GM	A-2, A-1	10-25	15-50	10-45	10-40	10-35	<30	NP-7
	16-30	Weathered bedrock.	---	---	---	---	---	---	---	---	---
	30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments >3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
CcF*:											
Sylco	0-6	Very channery loam.	GC, GM, GM, GM-GC	A-4, A-1-b, A-2-4	0-7	50-75	30-55	25-55	20-50	<30	4-10
	6-22	Very channery silt loam, flaggy loam, very channery silty clay loam.	CL-ML, CL, GC, GM-GC	A-4, A-1-b, A-2-4	8-20	55-85	30-80	25-75	20-70	20-30	5-10
	22-30	Weathered bedrock.									
	30-34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
CdD, CdE, CdF: Chandler	0-5	Gravelly fine sandy loam.	SM	A-2-4, A-4, A-1, A-5	0-15	70-85	60-75	30-65	20-50	30-50	NP-7
	5-60	Loam, fine sandy loam, sandy loam.	ML, SM, MH	A-4, A-5, A-2-4, A-2-5	0-15	90-100	85-100	60-85	25-65	30-60	NP-7
ChE, ChF: Cheoah	0-17	Channery loam	SM, GM, ML, MH	A-4, A-7-5, A-5	5-15	70-95	55-90	40-80	36-65	30-64	NP-11
	17-36	Loam, fine sandy loam, silt loam.	SM, SC, ML, CL	A-4	0-5	85-100	80-100	65-90	36-76	25-40	NP-10
	36-47	Channery loam, channery fine sandy loam, channery silt loam.	SM, SC, ML, CL	A-4	5-15	70-95	55-90	40-84	36-65	25-36	NP-10
	47-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---
CnC*, CnD*, CnE*:											
Chestnut	0-10	Gravelly fine sandy loam.	SM, SC-SM	A-4, A-2, A-5	5-15	75-95	65-90	60-85	30-49	<50	NP-7
	10-36	Gravelly loam, gravelly fine sandy loam, cobbly fine sandy loam.	SM, SC-SM	A-4, A-2, A-5	0-25	75-98	65-97	60-85	34-49	<45	NP-10
	36-45	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Edneyville	0-5	Loam	SM, SC-SM, MH, ML	A-2, A-4, A-5	0-5	85-100	80-100	65-95	30-69	25-61	NP-7
	5-43	Fine sandy loam, sandy loam, loam.	SM, SC-SM, ML, CL-ML	A-2, A-4, A-5	0-5	85-100	80-100	65-95	30-68	25-45	NP-10
	43-64	Sandy loam, gravelly sandy loam, fine sandy loam.	SM, SC-SM	A-2, A-4, A-5	0-10	75-100	65-100	60-88	28-49	25-45	NP-10

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments >3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
CpD*, CpE*, CpF*:											
Cleveland---	0-17	Sandy loam----	SM	A-2, A-4	2-5	80-95	75-90	60-80	20-50	<30	NP-3
	17-21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Chestnut----	0-10	Gravelly fine sandy loam.	SM, SC-SM	A-4, A-2, A-5	5-15	75-95	65-90	60-85	30-49	<50	NP-7
	10-36	Gravelly loam, gravelly fine sandy loam, cobbly fine sandy loam.	SM, SC-SM	A-4, A-2, A-5	0-25	75-98	65-97	60-85	34-49	<45	NP-10
	36-45	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
CsD, CsE------ Cullasaja	0-15	Very cobbly fine sandy loam.	SM, SP-SM, GM, GP-GM	A-1, A-2-5	40-70	45-70	35-50	15-35	10-20	41-70	NP-7
	15-65	Very cobbly loamy sand, extremely cobbly sandy loam, very cobbly sandy loam.	SM, SP-SM, GM, GP-GM	A-1, A-2-4	40-70	45-70	25-45	10-35	5-20	<40	NP-7
CuD*, CuE*, CuF*:											
Cullasaja---	0-17	Cobbly sandy clay loam.	SM	A-5, A-2-5, A-5	15-35	70-95	65-85	55-70	25-40	41-70	NP-7
	17-32	Cobbly sandy loam, very cobbly fine sandy loam, cobbly sandy loam.	SM, GM	A-1-b, A-2-4	30-60	55-85	50-75	35-60	15-30	25-40	NP-7
	32-65	Cobbly loamy sand, very cobbly sandy loam, extremely cobbly sandy loam.	SM, SP-SM, GM, GP-GM	A-1, A-2-4	40-70	45-70	25-45	10-35	5-20	25-40	NP-7

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
CuD*, CuE*, CuF*:											
Tuckasegee--	0-13	Fine sandy loam.	SM	A-2, A-4, A-5	0-10	85-100	80-100	65-80	30-50	19-50	NP-10
	13-26	Loam, fine sandy loam, sandy loam.	SM, ML	A-4	0-15	85-100	75-100	65-95	36-65	<40	NP-10
	26-47	Sandy clay loam, gravelly fine sandy loam, cobbly sandy loam.	SM	A-2-4, A-4, A-1-b	15-35	75-90	70-85	30-75	20-50	<40	NP-10
	47-65	Cobbly sandy clay loam, very cobbly sandy loam. loam.	SM, SC-SM, GM, GP-GM	A-2-4, A-1-b, A-1-a	25-60	45-85	35-75	25-55	12-35	<40	NP-7
DgB----------- Dellwood	0-16	Gravelly fine sandy loam.	SM	A-2-4, A-4, A-1-b	0-15	70-85	60-75	30-65	15-45	<37	NP-4
	16-40	Extremely gravelly sand, very cobbly sand, extremely gravelly coarse sand.	GM, GP-GM, GP, SP	A-1	30-50	13-75	10-40	4-40	1-15	<20	NP
DrB----------- Dillard	0-7	Loam----------	ML, CL	A-4	0-2	95-100	90-100	75-95	60-85	<35	NP-10
	7-50	Clay loam, sandy clay loam, loam.	CL, ML, SC	A-4, A-6, A-7	0-2	95-100	85-100	60-95	45-70	30-45	8-22
	50-60	Variable------	---	---	---	---	---	---	---	---	---
DsB, DsC------ Dillsboro	0-12	Loam----------	SM, SC, CL, ML	A-4, A-6, A-7-6	0-10	90-100	85-100	80-96	40-75	<42	NP-15
	12-50	Clay loam, clay.	CL, CH, ML, MH	A-7	0-5	95-100	90-100	80-96	65-80	40-60	15-35
	50-60	Loam, sandy clay loam, clay loam.	CL, SC, ML, SM	A-4, A-6, A-7-5	0-5	90-100	85-100	75-90	35-75	25-45	7-20
EdB*, EdC*, EdD*, EdE*, EdF*:											
Edneyville--	0-5	Loam----------	SM, SC-SM, MH, ML	A-2, A-4, A-5	0-5	85-100	80-100	65-95	30-69	25-61	NP-7
	5-43	Fine sandy loam, sandy loam, loam.	SM, SC-SM, ML, CL-ML	A-2, A-4, A-5	0-5	85-100	80-100	65-95	30-68	25-45	NP-10
	43-64	Sandy loam, gravelly sandy loam, fine sandy loam.	SM, SC-SM	A-2, A-4, A-5	0-10	75-100	65-100	60-88	28-49	25-45	NP-10

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification Unified	Classification AASHTO	Frag- ments >3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
EdB*, EdC*, EdD*, EdE*, EdF*:											
Chestnut----	0-10	Gravelly fine sandy loam.	SM, SC-SM	A-4, A-2, A-5	5-15	75-95	65-90	60-85	30-49	<50	NP-7
	10-36	Gravelly loam, gravelly fine sandy loam, cobbly fine sandy loam.	SM, SC-SM	A-4, A-2, A-5	0-25	75-98	65-97	60-85	34-49	<45	NP-10
	36-45	Weathered bedrock.	---	---	---	---	---	---	---	---	---
EeC*, EeD*:											
Edneyville---	0-5	Loam----------	SM, SC-SM, MH, ML	A-2, A-4, A-5	0-5	85-100	80-100	65-95	30-69	25-61	NP-7
	5-43	Fine sandy loam, sandy loam, loam.	SM, SC-SM, ML, CL-ML	A-2, A-4, A-5	0-5	85-100	80-100	65-95	30-68	25-45	NP-10
	43-64	Sandy loam, gravelly sandy loam, fine sandy loam.	SM, SC-SM	A-2, A-4, A-5	0-10	75-100	65-100	60-88	28-49	25-45	NP-10
Chestnut-----	0-10	Gravelly fine sandy loam.	SM, SC-SM	A-4, A-2, A-5	5-15	75-95	65-90	60-85	30-49	<50	NP-7
	10-36	Gravelly loam, gravelly fine sandy loam, cobbly fine sandy loam.	SM, SC-SM	A-4, A-2, A-5	0-25	75-98	65-97	60-85	34-49	<45	NP-10
	36-45	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Urban land.											
EvB*, EvC*, EvD*, EvE*, EvF*:											
Evard-------	0-5	Fine sandy loam.	SM, ML	A-2, A-4	0-5	80-100	75-100	65-90	20-60	<35	NP-9
	5-35	Sandy clay loam, clay loam.	SM, SC, ML, CL	A-2, A-4, A-6, A-7-6	0-2	90-100	85-100	60-95	30-70	25-45	7-18
	35-45	Sandy loam, loam, sandy clay loam.	SM, SC, ML, CL	A-2, A-4	0-5	80-100	75-100	60-95	20-55	<25	NP-9
	45-61	Sandy loam, loam, loamy sand.	SM	A-2, A-4	0-15	75-100	70-100	60-90	15-50	---	NP
	61-66	Weathered bedrock.									

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag-ments >3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct					Pct	
EvB*, EvC*, EvD*, EvE*, EvF*:											
Cowee-------	0-10	Sandy loam----	SM, SC-SM, ML	A-2-4, A-4, A-5, A-2-5	0-5	90-100	85-100	60-85	30-55	26-41	NP-12
	10-38	Gravelly sandy clay loam, gravelly sandy loam, clay loam.	SC, CL, ML, SM	A-4, A-6, A-7, A-2	0-15	47-99	45-90	32-85	17-60	26-56	5-22
	38-45	Weathered bedrock.	---	---	---	---	---	---	---	---	---
ExC*, ExD*:											
Evard--------	0-5	Fine sandy loam.	SM, ML	A-2, A-4	0-5	80-100	75-100	65-90	20-60	<35	NP-9
	5-35	Sandy clay loam, clay loam.	SM, SC, ML, CL	A-2, A-4, A-6, A-7-6	0-2	90-100	85-100	60-95	30-70	25-45	7-18
	35-45	Sandy loam, loam, sandy clay loam.	SM, SC, ML, CL	A-2, A-4	0-5	80-100	75-100	60-95	20-55	<25	NP-9
	45-61	Sandy loam, loam, loamy sand.	SM	A-2, A-4	0-15	75-100	70-100	60-90	15-50	---	NP
	61-66	Weathered bedrock.									
Cowee--------	0-10	Sandy loam----	SM, SC-SM, ML	A-2-4, A-4, A-5, A-2-5	0-5	90-100	85-100	60-85	30-55	26-41	NP-12
	10-38	Gravelly sandy clay loam, gravelly sandy loam, clay loam.	SC, CL, ML, SM	A-4, A-6, A-7, A-2	0-15	47-99	45-90	32-85	17-60	26-56	5-22
	38-45	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Urban land.											
FaC, FaD, FaE, FaF---------- Fannin	0-7	Fine sandy loam.	ML, SM, MH	A-4, A-2, A-5, A-7-5	0-5	92-100	86-100	60-95	34-85	30-51	NP-18
	7-21	Clay loam, sandy clay loam, loam.	ML, MH, SM	A-4, A-7, A-6	2-10	97-100	90-100	67-95	40-85	30-55	5-23
	21-60	Loam, sandy loam, fine sandy loam.	SM, ML	A-2, A-4, A-5	0-15	75-100	70-98	60-90	15-70	30-51	NP-10

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments >3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
HaB2, HaC2, HaD2---------Hayesville	0-6	Clay loam-----	CL, SC, ML	A-4, A-6, A-7	0-5	90-100	85-100	80-95	45-65	30-50	7-18
	6-33	Clay loam, clay.	ML, MH, CL, CH	A-6, A-7	0-5	90-100	85-100	70-100	55-80	36-66	11-35
	33-45	Sandy clay loam, clay loam, loam.	SM, ML, MH, CL	A-6, A-7	0-5	90-100	90-100	85-95	45-65	36-55	11-25
	45-60	Fine sandy loam, loam, sandy clay loam.	SM, ML, CL, SC	A-4, A-6	5-15	90-100	90-95	65-90	40-55	25-40	NP-12
HmA-----------Hemphill	0-8	Loam----------	SM, ML	A-4	0	95-100	93-100	65-100	40-90	25-50	4-16
	8-28	Clay, silty clay, clay loam.	CL, CH, MH, ML	A-6, A-7	0	95-100	95-100	85-100	65-95	30-60	11-29
	28-60	Sandy clay loam, loam, clay loam.	SM, SC-SM, CL-ML, ML	A-4, A-5, A-6, A-7	0	95-100	90-100	65-100	40-90	25-50	NP-16
NkA-----------Nikwasi	0-9	Fine sandy loam.	SM, ML	A-2-4, A-4	0-5	90-100	80-99	50-93	17-55	<37	NP-4
	9-25	Loamy sand, sand, sandy loam.	SM, SP-SM	A-2-4, A-1-b	0-10	90-100	80-95	40-80	10-44	<25	NP-4
	25-60	Extremely gravelly coarse sand, very gravelly sand, very cobbly loamy sand.	GP-GM, GM, SM, SP-SM	A-1	10-50	25-75	10-55	7-40	1-15	---	NP
OwE-----------Oconaluftee	0-12	Channery loam	SM, ML, GM	A-4, A-5	5-15	70-95	55-90	40-80	36-65	30-75	NP-7
	12-44	Channery loam, fine sandy loam, channery fine sandy loam.	SM, SC, ML, CL	A-4, A-5	5-15	70-100	55-100	40-94	36-77	25-45	NP-10
	44-60	Flaggy fine sandy loam, fine sandy loam, channery fine sandy loam.	SM, SC, ML, CL	A-4, A-5	5-15	70-100	55-100	40-91	36-69	25-45	NP-10
PwC, PwD, PwE, PwF----------Plott	0-14	Fine sandy loam.	SM, ML, MH	A-2, A-4, A-5	0-5	90-100	80-99	50-85	25-70	30-67	NP-7
	14-46	Loam, fine sandy loam, sandy loam.	SM, SC-SM, ML, CL-ML	A-2, A-4, A-5	0-5	90-100	80-95	50-85	20-70	25-44	NP-10
	46-62	Gravelly fine sandy loam, cobbly sandy loam, loamy sand.	SM, SC-SM, SP-SM, GM	A-2-4, A-1-b	5-15	58-92	56-89	20-72	10-30	25-36	NP-7

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag-ments >3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct					Pct	
ReA----------- Reddies	0-12	Fine sandy loam.	SM, ML	A-2-4, A-4	0-5	90-100	80-100	50-95	25-55	25-37	NP-7
	12-35	Fine sandy loam, sandy loam, gravelly sandy loam.	SM, ML	A-2-4, A-4, A-1-b	0-15	70-100	60-95	30-85	15-55	25-35	NP-7
	35-60	Extremely gravelly sand, very gravelly sand, very cobbly sand.	GM, GP-GM, SM, SP-SM	A-1	10-50	13-75	10-55	4-40	1-15	<25	NP
RhF*:											
Rock outcrop.											
Cataska------	0-6	Very channery loam.	GM-GC, GM	A-2, A-4, A-1	15-25	45-75	40-70	35-65	25-50	<30	NP-6
	6-16	Channery silt loam, channery silt loam, very channery loam.	GM-GC, GM, GP-GM	A-2, A-1	10-25	15-50	10-45	10-40	10-35	<30	NP-7
	16-30	Weathered bedrock.	---	---	---	---	---	---	---	---	---
	30-34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
RkF*:											
Rock outcrop.											
Cleveland----	0-17	Sandy loam----	SM	A-2, A-4	2-5	80-95	75-90	60-80	20-50	<30	NP-3
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
RsA----------- Rosman	0-16	Fine sandy loam.	ML, SM, SC-SM	A-2-4, A-4, A-2-5	0	95-100	90-100	75-100	30-60	<41	NP-7
	16-60	Loam, fine sandy loam, sandy loam.	ML, SM, SC-SM	A-2-4, A-4	0	95-100	90-100	75-100	30-85	<39	NP-8
SbC, SbD, SbE- Saunook	0-10	Gravelly loam	SM, MH, ML	A-2, A-4, A-1, A-5	5-15	70-85	60-75	30-65	20-55	30-59	NP-14
	10-34	Loam, clay loam, sandy clay loam.	SC, CL, ML, MH	A-4, A-6, A-7-5, A-7-6	0-5	90-100	85-100	75-95	35-75	25-55	7-20
	34-60	Very cobbly fine sandy loam, cobbly fine sandy loam, cobbly sandy loam.	SM, GM	A-4, A-1-b, A-2-4	15-35	55-80	55-80	30-75	20-50	25-40	NP-10

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments >3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
ScB, ScC------ Saunook	0-8	Loam----------	SM, ML, MH	A-2, A-4, A-5, A-7-5	0-5	90-100	85-100	60-90	25-65	30-59	NP-14
	8-50	Loam, clay loam, sandy clay loam.	SC, CL, ML, MH	A-4, A-6, A-7-5, A-7-6	0-5	90-100	85-100	75-95	35-75	25-55	7-20
	50-60	Cobbly sandy clay loam, gravelly loam, fine sandy loam.	SC, CL, ML, GM	A-4, A-6, A-2-4, A-2-6	5-25	55-99	55-97	45-83	30-55	25-45	7-17
SoD*, SoE*, SoF*:											
Soco--------	0-5	Channery fine sandy loam.	SM, ML, GM, MH	A-4, A-5	5-15	70-96	55-92	40-83	36-65	20-55	NP-7
	5-22	Channery loam, channery fine sandy loam, flaggy fine sandy loam.	SM, SC, ML, CL	A-4, A-6	5-15	70-95	55-91	40-91	35-65	25-40	NP-11
	22-35	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Stecoah-----	0-6	Channery fine sandy loam.	SM, ML, GM, MH	A-4, A-5	5-15	70-96	55-92	40-83	36-65	30-55	NP-7
	6-29	Channery loam, channery fine sandy loam, loam.	SM, SC, ML, CL	A-4, A-6	0-15	70-100	55-100	40-94	36-77	25-40	NP-12
	29-54	Channery loam, channery fine sandy loam, loam.	SM, SC, ML, CL	A-4	5-15	70-100	55-100	40-91	35-69	24-40	NP-10
	54-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---
SrC*, SrD*, SrE*:											
Spivey------	0-18	Very flaggy loam.	GM, GC, SM	A-2, A-4, A-5	30-50	55-85	50-75	35-60	25-50	30-70	NP-10
	18-60	Very flaggy loam, flaggy fine sandy loam.	GM, SM	A-1, A-2, A-4	20-60	55-85	40-75	30-60	20-50	25-40	NP-10
Santeetlah--	0-16	Loam----------	SM, ML, MH	A-4, A-5	0-5	85-100	80-100	65-92	36-77	30-74	NP-7
	16-42	Loam, fine sandy loam, silt loam.	SM, ML	A-4, A-6, A-7-6	0-5	85-100	80-100	65-90	36-75	25-41	NP-11
	42-60	Very channery loam, flaggy loam, very channery fine sandy loam.	SM, ML, GM	A-4, A-2-4	15-25	60-95	50-80	35-75	25-55	25-40	NP-10
StB----------- Statler	0-10	Fine sandy loam.	ML, CL-ML, CL	A-4, A-6	0	95-100	75-100	70-100	53-75	25-37	3-14
	10-60	Clay loam, sandy clay loam, loam.	CL, CL-ML	A-4, A-6, A-7	0	95-100	75-100	70-100	60-80	25-52	5-27

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag-ments >3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct					Pct	
SxE*:											
Sylco	0-6	Very channery loam.	GC, SC, GM, GM-GC	A-4, A-1-b, A-2-4	0-7	50-75	30-55	25-55	20-50	<30	4-10
	6-22	Very channery silt loam, flaggy loam, very channery silty clay loam.	CL-ML, CL, GC, GM-GC	A-4, A-1-b, A-2-4	6-20	55-85	30-80	25-75	20-70	20-30	5-10
	22-30	Weathered bedrock.									
	30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Cataska	0-6	Very channery loam.	GM-GC, GM	A-2, A-4, A-1	15-25	45-75	40-70	35-65	25-50	<30	NP-6
	6-16	Channery silt loam, channery silt loam, very channery loam.	GM-GC, GM, GP-GM	A-2, A-1	10-25	15-50	10-45	10-40	10-35	<30	NP-7
	16-30	Weathered bedrock.	---	---	---	---	---	---	---	---	---
	30-34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
SyA*:											
Sylva	0-8	Loam	SM, ML	A-2, A-4, A-5	0-5	90-100	80-100	50-90	25-55	30-50	NP-10
	8-32	Fine sandy loam, sandy loam, loam.	SM, ML, SC-SM, CL-ML	A-2, A-4	0-5	90-100	80-100	50-90	25-55	25-40	NP-10
	32-53	Loamy sand, sandy loam.	SM, SP-SM	A-2-4, A-1-b	0-5	88-100	80-100	40-75	10-35	<25	NP-4
	53-60	Fine sandy loam, sandy loam, loam.	SM, ML, SC-SM, CL-ML	A-2, A-4	0-5	90-100	80-100	50-90	23-55	25-40	NP-10
Whiteside	0-11	Loam	SM, ML	A-2, A-4, A-5	0-5	90-100	80-100	50-87	25-55	30-50	NP-10
	11-37	Sandy clay loam, loam, clay loam.	SM, ML, SC	A-2, A-4, A-6, A-5	0-5	90-100	80-100	50-90	30-56	30-50	4-15
	37-60	Sandy clay loam, fine sandy loam, sandy loam.	ML, SM, CL-ML, SC-SM	A-2-4, A-4	0-5	90-100	80-100	50-85	25-60	25-40	NP-10
ToA Toxaway	0-36	Loam	CL, ML, CL-ML, MH	A-4, A-6, A-7	0	98-100	95-100	85-100	51-90	25-55	6-22
	36-60	Sand, loam, silty clay loam.	CL, ML, SM, SC	A-2, A-4, A-6	5-15	95-100	85-100	60-95	25-90	20-40	NP-15

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments >3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
TrE, TrF------ Trimont	0-9	Gravelly loam	SM, ML	A-2-4, A-4, A-1, A-5	5-15	70-85	60-75	30-65	20-55	30-51	NP-10
	9-45	Clay loam, sandy clay loam, loam.	SC, CL, ML, SM	A-4, A-6, A-7	0-5	90-100	85-100	75-90	35-65	25-51	6-18
	45-60	Gravelly sandy loam, loam, sandy loam.	SM, ML, CL, SC	A-2-4, A-4, A-1, A-5	0-15	70-100	60-100	30-85	20-65	25-50	NP-16
TsC*:											
Tuckasegee---	0-13	Fine sandy loam.	SM	A-2, A-4, A-5	0-10	85-100	80-100	65-80	30-50	19-50	NP-10
	13-26	Loam, fine sandy loam, sandy loam.	SM, ML	A-4	0-15	85-100	75-100	65-95	36-65	<40	NP-10
	26-47	Stony sandy clay loam, stony fine sandy loam, stony sandy loam.	SM	A-2-4, A-4, A-1-b	15-35	75-90	70-85	30-75	20-50	<40	NP-10
	47-65	Very stony sandy clay loam, very stony sandy loam.	SM, SC-SM, GM, GP-GM	A-2-4, A-1-b, A-1-a	25-60	45-85	35-75	25-55	12-35	<40	NP-7
Cullasaja----	0-17	Cobbly sandy clay loam.	SM	A-5, A-2-5, A-5	15-35	70-95	65-85	55-70	25-40	41-70	NP-7
	17-32	Very cobbly sandy loam, very cobbly fine sandy loam, very cobbly sandy loam.	SM, GM	A-1-b, A-2-4	30-60	55-85	50-75	35-60	15-30	25-40	NP-7
	32-65	Cobbly loamy sand, very cobbly sandy loam, extremely cobbly sandy loam.	SM, SP-SM, GM, GP-GM	A-1, A-2-4	40-70	45-70	25-45	10-35	5-20	25-40	NP-7

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments >3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
TwB*, TwC*:											
Tuckasegee---	0-13	Fine sandy loam.	SM	A-2, A-4, A-5	0-10	85-100	80-100	65-80	30-50	19-50	NP-10
	13-26	Loam, fine sandy loam, sandy loam.	SM, ML	A-4	0-15	85-100	75-100	65-95	36-65	<40	NP-10
	26-47	Sandy clay loam, gravelly fine sandy loam, cobbly sandy loam.	SM	A-2-4, A-4, A-1-b	15-35	75-90	70-85	30-75	20-50	<40	NP-10
	47-65	Very cobbly sandy clay loam, very cobbly sandy loam.	SM, SC-SM, GM, GP-GM	A-2-4, A-1-b, A-1-a	25-60	45-85	35-75	25-55	12-35	<40	NP-7
Whiteside----	0-11	Loam----------	SM, ML	A-2, A-4, A-5	0-5	90-100	80-100	50-87	25-55	30-50	NP-10
	11-37	Sandy clay loam, loam, clay loam.	SM, ML, SC	A-2, A-4, A-6, A-5	0-5	90-100	80-100	50-90	30-56	30-50	4-15
	37-60	Sandy clay loam, fine sandy loam, sandy loam.	ML, SM, CL-ML, SC-SM	A-2-4, A-4	0-5	90-100	80-100	50-85	25-60	25-40	NP-10
Ud. Udorthents											
UfB*: Udorthents.											
Urban land.											
WeC, WeD, WeE, WeF---------- Wayah	0-15	Sandy loam----	SM, ML	A-2, A-4, A-5	0-5	90-100	80-98	50-88	25-65	30-50	NP-7
	15-37	Gravelly loam, sandy loam, gravelly sandy loam.	SM, SC-SM, GM, ML	A-2-4, A-4, A-1-b	3-15	53-99	50-97	30-87	20-55	25-35	NP-7
	37-60	Gravelly fine sandy loam, gravelly sandy loam, gravelly loamy sand.	SM, SP-SM, GM, GP-GM	A-2-4, A-1-b	3-15	53-87	50-80	20-50	10-30	20-35	NP-4

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
ArA-------------- Arkaqua	0-10	10-20	1.20-1.50	0.6-2.0	0.12-0.20	4.5-6.5	Low-----------	0.24	4	2-5
	10-48	15-34	1.20-1.55	0.6-2.0	0.12-0.20	4.5-6.5	Low-----------	0.28		
	48-60	---	---	0.6-2.0	---	---	-------------	----		
BeA-------------- Biltmore	0-12	6-18	1.45-1.65	2.0-6.0	0.10-0.15	5.1-7.3	Low-----------	0.15	5	2-5
	12-60	4-12	1.60-1.70	6.0-20	0.06-0.10	5.1-7.3	Low-----------	0.10		
BkB2, BkC2-------- Braddock	0-11	27-40	1.20-1.50	0.6-2.0	0.14-0.19	4.5-7.3	Low-----------	0.32	3	.5-1
	11-57	35-55	1.20-1.50	0.6-2.0	0.12-0.17	4.5-7.3	Moderate------	0.24		
	57-60	20-45	1.20-1.50	0.6-6.0	0.06-0.12	4.5-7.3	Low-----------	0.24		
BrC*, BrD*:										
Braddock---------	0-11	27-40	1.20-1.50	0.6-2.0	0.14-0.19	4.5-5.5	Low-----------	0.32	3	.5-1
	11-57	35-55	1.20-1.50	0.6-2.0	0.12-0.17	4.5-5.5	Moderate------	0.24		
	57-60	20-45	1.20-1.50	0.6-6.0	0.06-0.12	4.5-5.5	Low-----------	0.24		
Urban land.										
BsC*, BsD*, BsE*, BsF*:										
Brasstown-------	0-6	5-18	1.00-1.40	2.0-6.0	0.12-0.18	3.6-6.0	Low-----------	0.28	3	1-5
	6-36	18-35	1.35-1.60	0.6-2.0	0.12-0.18	3.6-6.0	Low-----------	0.15		
	36-45	8-20	1.40-1.65	0.6-2.0	0.10-0.15	3.6-6.0	Low-----------	0.15		
	45-60	---	---	---	---	---	-------------	----		
Junaluska-------	0-5	5-18	1.35-1.60	2.0-6.0	0.10-0.15	3.6-6.0	Low-----------	0.15	2	1-5
	5-21	18-35	1.30-1.65	0.6-2.0	0.12-0.18	3.6-6.0	Low-----------	0.15		
	21-36	15-20	1.35-1.65	2.0-6.0	0.10-0.15	3.6-6.0	Low-----------	0.15		
	36-45	---	---	---	---	---	-------------	----		
BuD*, BuF*:										
Burton-----------	0-18	5-18	1.10-1.30	2.0-6.0	0.16-0.23	3.6-6.0	Low-----------	0.24	2	8-20
	18-36	5-18	1.45-1.65	2.0-6.0	0.07-0.12	3.6-6.0	Low-----------	0.15		
	36	---	---	---	---	---	-------------	----		
Craggey----------	0-17	8-20	1.10-1.30	2.0-6.0	0.10-0.15	3.6-6.0	Low-----------	0.15	1	8-20
	17-21	---	---	---	---	---	-------------	----		
Rock outcrop.										
CaE, CaF--------- Cashiers	0-8	5-18	1.30-1.50	2.0-6.0	0.11-0.15	4.5-6.0	Low-----------	0.28	4	5-10
	8-49	5-18	1.30-1.50	2.0-6.0	0.13-0.18	4.5-6.0	Low-----------	0.32		
	49-60	5-18	1.30-1.50	2.0-6.0	0.10-0.14	4.5-6.0	Low-----------	0.32		
CcF*:										
Cataska----------	0-6	12-22	1.30-1.40	2.0-6.0	0.08-0.12	3.6-5.5	Low-----------	0.15	1	1-3
	6-16	12-22	1.30-1.45	2.0-6.0	0.04-0.09	3.6-5.5	Low-----------	0.15		
	16-30	---	---	0.2-0.01	---	---	-------------	----		
	30	---	---	---	---	---	-------------	----		
Sylco------------	0-6	15-25	1.00-1.20	0.6-2.0	0.11-0.16	3.6-5.5	Low-----------	0.20	2	1-5
	6-22	15-35	1.30-1.50	0.6-2.0	0.10-0.15	3.6-5.5	Low-----------	0.20		
	22-30	---	---	0.0-0.01	---	---	-------------	----		
	30-34	---	---	0.00-0.01	---	---	-------------	----		

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
CdD, CdE, CdF----- Chandler	0-5	5-18	1.30-1.50	2.0-6.0	0.10-0.14	4.5-6.0	Low-----------	0.28	3	1-8
	5-60	5-18	1.30-1.50	2.0-6.0	0.11-0.15	4.5-6.0	Low-----------	0.32		
ChE, ChF--------- Cheoah	0-17	5-18	1.35-1.60	2.0-6.0	0.12-0.18	3.6-5.5	Low-----------	0.15	3	5-10
	17-36	5-18	1.35-1.60	2.0-6.0	0.14-0.22	3.6-6.0	Low-----------	0.32		
	36-47	5-18	1.35-1.60	2.0-6.0	0.11-0.17	3.6-6.0	Low-----------	0.20		
	47-60	---	---	---	---	---	-------------	----		
CnC*, CnD*, CnE*:										
Chestnut---------	0-10	5-20	1.35-1.60	2.0-6.0	0.08-0.12	4.5-6.0	Low-----------	0.17	2	1-8
	10-36	5-25	1.35-1.60	2.0-6.0	0.08-0.12	4.5-6.0	Low-----------	0.15		
	36-45	---	---	---	---	---	-------------	----		
Edneyville------	0-5	5-18	1.40-1.60	2.0-6.0	0.11-0.17	4.5-6.0	Low-----------	0.24	4	1-8
	5-43	7-20	1.40-1.60	2.0-6.0	0.10-0.16	4.5-6.0	Low-----------	0.20		
	43-64	5-20	1.40-1.60	2.0-6.0	0.08-0.14	4.5-6.0	Low-----------	0.20		
CpD*, CpE*, CpF*:										
Cleveland-------	0-17	6-20	1.20-1.50	2.0-6.0	0.08-0.12	4.5-6.0	Low-----------	0.24	1	.5-8
	17-21	---	---	---	---	---	-------------	----		
Chestnut---------	0-10	5-20	1.35-1.60	2.0-6.0	0.08-0.12	4.5-6.0	Low-----------	0.17	2	1-8
	10-36	5-25	1.35-1.60	2.0-6.0	0.08-0.12	4.5-6.0	Low-----------	0.15		
	36-45	---	---	---	---	---	-------------	----		
Rock outcrop.										
CsD, CsE--------- Cullasaja	0-15	5-25	0.50-1.20	2.0-6.0	0.07-0.10	4.5-6.0	Low-----------	0.02	5	5-18
	15-65	2-15	1.00-1.60	2.0-6.0	0.03-0.06	4.5-6.0	Low-----------	0.05		
CuD*, CuE*, CuF*:										
Cullasaja-------	0-17	5-25	0.50-1.20	2.0-6.0	0.10-0.16	4.5-6.5	Low-----------	0.10	5	5-18
	17-32	5-20	1.00-1.60	2.0-6.0	0.07-0.10	4.5-6.0	Low-----------	0.05		
	32-65	2-15	1.00-1.60	2.0-6.0	0.03-0.06	4.5-6.0	Low-----------	0.05		
Tuckasegee------	0-13	12-20	0.85-1.20	2.0-6.0	0.14-0.22	4.5-6.5	Low-----------	0.24	5	4-15
	13-26	15-27	1.00-1.40	2.0-6.0	0.15-0.21	4.5-6.0	Low-----------	0.20		
	26-47	15-27	1.20-1.50	2.0-6.0	0.11-0.16	4.5-6.0	Low-----------	0.15		
	47-65	10-25	1.20-1.50	2.0-6.0	0.07-0.12	4.5-6.0	Low-----------	0.10		
DgB-------------- Dellwood	0-16	5-15	1.30-1.50	2.0-6.0	0.08-0.12	4.5-7.3	Low-----------	0.10	2	3-8
	16-40	1-8	1.40-1.60	>6.0	0.02-0.05	4.5-7.3	Low-----------	0.05		
DrB-------------- Dillard	0-7	10-25	1.20-1.50	0.6-2.0	0.15-0.20	5.1-6.0	Low-----------	0.32	4	.5-5
	7-50	18-35	1.40-1.60	0.6-2.0	0.12-0.16	4.5-5.5	Low-----------	0.28		
	50-60	---	---	0.00-0.2	---	---	-------------	----		
DsB, DsC--------- Dillsboro	0-12	10-27	1.00-1.70	2.0-6.0	0.11-0.20	4.5-7.3	Low-----------	0.20	5	2-8
	12-50	35-60	1.20-1.60	0.6-2.0	0.17-0.19	4.5-7.3	Moderate-----	0.28		
	50-60	18-35	1.30-1.60	0.6-2.0	0.12-0.18	4.5-6.0	Low-----------	0.24		
EdB*, EdC*, EdD*, EdE*, EdF*:										
Edneyville-----	0-5	5-18	1.40-1.60	2.0-6.0	0.11-0.17	4.5-6.0	Low-----------	0.24	4	1-8
	5-43	7-20	1.40-1.60	2.0-6.0	0.10-0.16	4.5-6.0	Low-----------	0.20		
	43-64	5-20	1.40-1.60	2.0-6.0	0.08-0.14	4.5-6.0	Low-----------	0.20		
Chestnut-------	0-10	5-20	1.35-1.60	2.0-6.0	0.08-0.12	3.6-6.0	Low-----------	0.17	2	1-8
	10-36	5-25	1.35-1.60	2.0-6.0	0.08-0.12	3.6-6.0	Low-----------	0.15		
	36-45	---	---	---	---	---	-------------	----		

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
EeC*, EeD*:										
Edneyville------	0-5	5-18	1.40-1.60	2.0-6.0	0.11-0.17	4.5-6.0	Low-----------	0.24	4	1-8
	5-43	7-20	1.40-1.60	2.0-6.0	0.10-0.16	4.5-6.0	Low-----------	0.20		
	43-64	5-20	1.40-1.60	2.0-6.0	0.08-0.14	4.5-6.0	Low-----------	0.20		
Chestnut--------	0-10	5-20	1.35-1.60	2.0-6.0	0.08-0.12	4.5-6.0	Low-----------	0.17	2	1-8
	10-36	5-25	1.35-1.60	2.0-6.0	0.08-0.12	4.5-6.0	Low-----------	0.15		
	36-45	---	---	---	---	---	-------------	----		
Urban land.										
EvB*, EvC*, EvD*, EvE*, EvF*:										
Evard----------	0-5	5-20	1.30-1.60	2.0-6.0	0.10-0.14	4.5-6.0	Low-----------	0.24	5	1-5
	5-35	18-35	1.30-1.50	0.6-2.0	0.12-0.16	4.5-6.0	Low-----------	0.24		
	35-45	12-30	1.20-1.40	0.6-2.0	0.10-0.25	4.5-6.0	Low-----------	0.24		
	45-61	5-20	1.20-1.40	0.6-2.0	0.08-0.12	4.5-6.0	Low-----------	0.24		
	61-66	---	---	---	---	---	-------------	----		
Cowee----------	0-10	8-20	1.25-1.60	2.0-6.0	0.12-0.20	4.5-6.0	Low-----------	0.28	2	1-5
	10-38	18-35	1.30-1.60	0.6-2.0	0.12-0.18	4.5-6.0	Low-----------	0.24		
	38-45	---	---	---	---	---	-------------	----		
ExC*, ExD*:										
Evard-----------	0-5	5-20	1.30-1.60	2.0-6.0	0.10-0.14	4.5-6.0	Low-----------	0.24	5	1-5
	5-35	18-35	1.30-1.50	0.6-2.0	0.12-0.16	4.5-6.0	Low-----------	0.24		
	35-45	12-30	1.20-1.40	0.6-2.0	0.10-0.25	4.5-6.0	Low-----------	0.24		
	45-61	5-20	1.20-1.40	0.6-2.0	0.08-0.12	4.5-6.0	Low-----------	0.24		
	61-66	---	---	---	---	---	-------------	----		
Cowee-----------	0-10	8-20	1.25-1.60	2.0-6.0	0.12-0.20	4.5-6.0	Low-----------	0.28	2	1-5
	10-38	18-35	1.30-1.60	0.6-2.0	0.12-0.18	4.5-6.0	Low-----------	0.24		
	38-45	---	---	---	---	---	-------------	----		
Urban land.										
FaC, FaD, FaE, FaF-------------- Fannin	0-7	5-25	1.30-1.50	2.0-6.0	0.12-0.18	4.5-6.5	Low-----------	0.32	3	1-5
	7-21	18-35	1.30-1.50	0.6-2.0	0.11-0.17	4.5-6.5	Low-----------	0.24		
	21-60	5-25	1.30-1.50	0.6-2.0	0.08-0.12	4.5-6.5	Low-----------	0.24		
HaB2, HaC2, HaD2- Hayesville	0-6	20-40	1.30-1.50	0.6-2.0	0.12-0.20	3.6-6.5	Low-----------	0.24	5	1-3
	6-33	30-50	1.20-1.35	0.6-2.0	0.15-0.20	3.6-6.0	Low-----------	0.24		
	33-45	20-40	1.30-1.40	0.6-2.0	0.12-0.20	3.6-6.0	Low-----------	0.20		
	45-60	5-25	1.45-1.65	2.0-6.0	0.11-0.15	3.6-6.0	Low-----------	0.17		
HmA-------------- Hemphill	0-8	8-27	1.20-1.45	0.6-2.0	0.15-0.24	4.5-7.3	Low-----------	0.32	5	3-10
	8-28	35-60	1.20-1.45	0.06-0.2	0.15-0.20	4.5-7.3	High----------	0.28		
	28-60	8-35	1.20-1.45	0.2-0.6	0.12-0.20	4.5-7.3	Low-----------	0.24		
NkA-------------- Nikwasi	0-9	5-18	1.30-1.50	2.0-6.0	0.13-0.20	4.5-6.5	Low-----------	0.20	3	5-12
	9-25	3-12	1.35-1.55	2.0-20	0.05-0.10	4.5-5.5	Low-----------	0.10		
	25-60	1-5	1.40-1.60	>6.0	0.02-0.05	4.5-6.5	Low-----------	0.05		
OwE-------------- Oconaluftee	0-12	5-18	1.00-1.30	2.0-6.0	0.13-0.18	3.6-5.5	Low-----------	0.15	3	8-20
	12-44	5-18	1.20-1.50	2.0-6.0	0.11-0.17	3.6-6.0	Low-----------	0.20		
	44-60	5-18	1.35-1.60	2.0-6.0	0.11-0.17	3.6-6.0	Low-----------	0.20		

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
PwC, PwD, PwE, PwF: Plott	0-14	4-18	1.00-1.20	2.0-6.0	0.18-0.28	3.6-6.0	Low	0.24	4	5-15
	14-46	5-20	1.20-1.40	2.0-6.0	0.14-0.24	4.5-6.0	Low	0.24		
	46-62	2-18	1.20-1.60	2.0-6.0	0.05-0.20	4.5-6.0	Low	0.15		
ReA: Reddies	0-12	5-18	1.30-1.50	2.0-6.0	0.10-0.18	4.5-7.3	Low	0.20	3	3-8
	12-35	5-18	1.35-1.55	2.0-6.0	0.08-0.15	4.5-7.3	Low	0.10		
	35-60	1-5	1.40-1.60	>6.0	0.02-0.05	4.5-7.3	Low	0.05		
RhF*:										
Rock outcrop.										
Cataska	0-6	12-22	1.30-1.40	2.0-20	0.08-0.12	3.6-5.5	Low	0.15	1	1-3
	6-16	12-22	1.30-1.45	0.00-0.06	0.04-0.09	3.6-5.5	Low	0.15		
	16-30	---	---	0.2-0.01	---	---	---	---		
	30-34	---	---	---	---	---	---	---		
RkF*:										
Rock outcrop.										
Cleveland	0-17	6-20	1.20-1.50	2.0-6.0	0.08-0.12	4.5-6.0	Low	0.24	1	.5-8
	17	---	---	---	---	---	---	---		
RsA: Rosman	0-16	8-18	1.25-1.40	2.0-6.0	0.12-0.18	5.1-6.5	Low	0.24	5	2-8
	16-60	8-18	1.25-1.50	2.0-6.0	0.10-0.18	5.1-6.5	Low	0.24		
SbC, SbD, SbE: Saunook	0-10	7-20	1.35-1.60	2.0-6.0	0.10-0.15	3.6-6.0	Low	0.15	5	3-10
	10-34	18-35	1.30-1.50	0.6-2.0	0.12-0.20	4.5-6.5	Low	0.24		
	34-60	7-20	1.35-1.60	2.0-6.0	0.07-0.12	4.5-6.5	Low	0.15		
ScB, ScC: Saunook	0-8	7-20	1.35-1.60	2.0-6.0	0.14-0.20	3.6-6.0	Low	0.24	5	3-10
	8-50	18-35	1.30-1.50	0.6-2.0	0.12-0.20	4.5-6.5	Low	0.24		
	50-60	18-35	1.30-1.50	0.6-2.0	0.09-0.15	4.5-6.5	Low	0.15		
SoD*, SoE*, SoF*:										
Soco	0-5	5-18	1.35-1.60	2.0-6.0	0.11-0.17	3.6-5.5	Low	0.15	2	1-8
	5-22	5-18	1.40-1.65	2.0-6.0	0.09-0.15	3.6-5.5	Low	0.15		
	22-35	---	---	---	---	---	---	---		
Stecoah	0-6	5-18	1.35-1.60	2.0-6.0	0.11-0.17	3.6-5.5	Low	0.15	3	1-8
	6-29	5-18	1.35-1.60	2.0-6.0	0.10-0.17	3.6-5.5	Low	0.32		
	29-54	5-18	1.40-1.65	2.0-6.0	0.10-0.15	3.6-5.5	Low	0.15		
	54-60	---	---	---	---	---	---	---		
SrC*, SrD*, SrE*:										
Spivey	0-18	5-20	1.20-1.40	2.0-6.0	0.09-0.20	3.6-6.0	Low	0.17	5	5-18
	18-60	5-20	1.30-1.50	2.0-6.0	0.07-0.11	3.6-6.0	Low	0.17		
Santeetlah	0-16	5-18	1.20-1.40	2.0-6.0	0.15-0.24	3.6-6.0	Low	0.28	5	5-10
	16-42	5-18	1.30-1.50	2.0-6.0	0.14-0.22	3.6-6.0	Low	0.32		
	42-60	5-18	1.35-1.55	2.0-6.0	0.08-0.13	3.6-6.0	Low	0.15		
StB: Statler	0-10	10-20	1.35-1.45	0.6-2.0	0.18-0.22	5.1-7.3	Low	0.32	5	2-6
	10-60	18-35	1.35-1.50	0.6-2.0	0.17-0.20	5.1-6.5	Low	0.24		
SxE*:										
Sylco	0-6	15-25	1.00-1.20	0.6-2.0	0.11-0.16	3.6-5.5	Low	0.20	2	1-5
	6-22	15-35	1.30-1.50	0.6-2.0	0.10-0.15	3.6-5.5	Low	0.20		
	22-30	---	---	0.0-0.01	---	---	---	---		
	30-34	---	---	0.00-0.01	---	---	---	---		

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
SxE*:										
Cataska	0-6	12-22	1.30-1.40	2.0-20	0.08-0.12	3.6-5.5	Low	0.15	1	1-3
	6-16	12-22	1.30-1.45	0.00-0.06	0.04-0.09	3.6-5.5	Low	0.15		
	16-30	---	---	0.2-0.01	---	---	-------------	----		
	30	---	---	---	---	---	-------------	----		
SyA*:										
Sylva	0-8	5-18	1.30-1.50	2.0-6.0	0.16-0.24	3.6-5.5	Low	0.24	5	4-10
	8-32	5-18	1.35-1.55	2.0-6.0	0.14-0.20	3.6-5.5	Low	0.24		
	32-53	4-12	1.60-1.70	2.0-6.0	0.06-0.10	3.6-5.5	Low	0.10		
	53-60	5-27	1.35-1.55	0.6-6.0	0.14-0.20	3.6-5.5	Low	0.24		
Whiteside	0-11	5-18	1.30-1.50	2.0-6.0	0.15-0.22	4.5-7.3	Low	0.24	5	2-8
	11-37	18-27	1.35-1.55	0.6-2.0	0.14-0.20	4.5-6.0	Low	0.24		
	37-60	8-35	1.35-1.60	0.6-6.0	0.10-0.16	4.5-6.0	Low	0.24		
ToA Toxaway	0-36	7-27	1.30-1.50	0.6-2.0	0.15-0.20	5.1-6.5	Low	0.17	5	2-10
	36-60	5-30	1.45-1.65	0.6-2.0	0.05-0.15	5.1-6.5	Low	0.17		
TrE, TrF Trimont	0-9	8-20	1.35-1.60	2.0-6.0	0.10-0.15	4.5-6.0	Low	0.15	4	3-9
	9-45	18-35	1.30-1.50	0.6-2.0	0.12-0.20	4.5-6.0	Low	0.24		
	45-60	8-20	1.40-1.65	0.6-2.0	0.10-0.15	4.5-6.0	Low	0.15		
TsC*:										
Tuckasegee	0-13	12-20	0.85-1.20	2.0-6.0	0.14-0.22	4.5-6.5	Low	0.24	5	4-15
	13-26	15-27	1.00-1.40	2.0-6.0	0.15-0.21	4.5-6.0	Low	0.20		
	26-47	15-27	1.20-1.50	2.0-6.0	0.11-0.16	4.5-6.0	Low	0.15		
	47-65	10-25	1.20-1.50	2.0-6.0	0.07-0.12	4.5-6.0	Low	0.10		
Cullasaja	0-17	5-25	0.50-1.20	2.0-6.0	0.10-0.16	4.5-6.0	Low	0.10	5	5-18
	17-32	5-20	1.00-1.60	2.0-6.0	0.07-0.10	4.5-6.0	Low	0.05		
	32-65	2-15	1.00-1.60	2.0-6.0	0.03-0.06	4.5-6.5	Low	0.05		
TwB*, TwC*:										
Tuckasegee	0-13	12-20	0.85-1.20	2.0-6.0	0.14-0.22	4.5-6.0	Low	0.24	5	4-15
	13-26	15-27	1.00-1.40	2.0-6.0	0.15-0.21	4.5-6.0	Low	0.20		
	26-47	15-27	1.20-1.50	2.0-6.0	0.11-0.16	4.5-6.0	Low	0.15		
	47-65	10-25	1.20-1.50	2.0-6.0	0.07-0.12	4.5-6.0	Low	0.10		
Whiteside	0-11	5-18	1.30-1.50	2.0-6.0	0.15-0.22	4.5-6.0	Low	0.24	5	2-8
	11-37	18-27	1.35-1.55	0.6-2.0	0.14-0.20	4.5-6.0	Low	0.24		
	37-60	8-35	1.35-1.60	0.6-6.0	0.10-0.16	4.5-6.0	Low	0.24		
Ud. Udorthents										
UfB*:										
Udorthents.										
Urban land.										
WeC, WeD, WeE, WeF Wayah	0-15	5-18	1.00-1.20	2.0-6.0	0.16-0.22	3.6-5.5	Low	0.24	3	8-20
	15-37	5-18	1.20-1.60	2.0-6.0	0.09-0.13	4.5-6.0	Low	0.15		
	37-60	3-15	1.40-1.65	2.0-6.0	0.05-0.09	4.5-6.0	Low	0.10		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--SOIL AND WATER FEATURES

("Flooding" and "water table" and terms such as "rare," "brief," and "apparent," are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydrologic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Bedrock: Depth	Bedrock: Hardness	Potential frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft			In				
ArA---------------- Arkaqua	C	Frequent----	Very brief	Dec-May	1.5-2.0	Apparent	Dec-May	>60	---	Moderate	High-----	Moderate.
BeA---------------- Biltmore	A	Frequent----	Brief-----	Jan-Dec	3.5-6.0	Apparent	Dec-May	>60	---	Low------	Low------	Moderate.
BkB2, BkC2--------- Braddock	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Moderate.
BrC*, BrD*:												
Braddock----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Moderate.
Urban land.												
BsC*, BsD*, BsE*, BsF*:												
Brasstown--------	B	None--------	---	---	>6.0	---	---	40-60	Soft	Moderate	Moderate	High.
Junaluska--------	B	None--------	---	---	>6.0	---	---	20-40	Soft	Moderate	Moderate	High.
BuD*, BuF*:												
Burton------------	B	None--------	---	---	>6.0	---	---	20-40	Hard	Moderate	High-----	High.
Craggey-----------	D	None--------	---	---	>6.0	---	---	10-20	Hard	Moderate	High-----	High.
Rock outcrop.												
CaE, CaF----------- Cashiers	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	Moderate.
CcF*:												
Cataska-----------	D	None--------	---	---	>6.0	---	---	10-20	Soft	Moderate	Low------	Moderate.
Sylco-------------	C	None--------	---	---	>6.0	---	---	20-40	Hard	Moderate	Low------	Moderate.
CdD, CdE, CdF------ Chandler	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.
ChE, ChF----------- Cheoah	B	None--------	---	---	>6.0	---	---	40-60	Soft	Moderate	Low------	High.

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Bedrock: Depth	Bedrock: Hardness	Potential frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft			In				
CnC*, CnD*, CnE*:												
Chestnut---------	B	None---------	---	---	>6.0	---	---	20-40	Soft	Moderate	Low-------	High.
Edneyville-------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Low-------	High.
CpD*, CpE*, CpF*:												
Cleveland--------	C	None---------	---	---	>6.0	---	---	10-20	Hard	Moderate	Low-------	High.
Chestnut---------	B	None---------	---	---	>6.0	---	---	20-40	Soft	Moderate	Low-------	High.
Rock outcrop.												
CsD, CsE---------- Cullasaja	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	High------	High.
CuD*, CuE*, CuF*:												
Cullasaja--------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	High------	High.
Tuckasegee-------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	High------	High.
DgB--------------- Dellwood	A	Frequent----	Very brief	Dec-Apr	2.0-4.0	Apparent	Jan-Apr	>60	---	Low-------	Low-------	Moderate.
DrB--------------- Dillard	C	Rare---------	---	---	2.0-3.0	Apparent	Dec-Apr	>60	---	Moderate	Moderate	High.
DsB, DsC---------- Dillsboro	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	High------	Moderate.
EdB*, EdC*, EdD*, EdE*, EdF*:												
Edneyville------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Low-------	High.
Chestnut--------	B	None---------	---	---	>6.0	---	---	20-40	Soft	Moderate	Low-------	High.
EeC*, EeD*:												
Edneyville-------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Low-------	High.
Chestnut---------	B	None---------	---	---	>6.0	---	---	20-40	Soft	Moderate	Low-------	High.
Urban land.												
EvB*, EvC*, EvD*, EvE*, EvF*:												
Evard-----------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	High.
Cowee-----------	B	None---------	---	---	>6.0	---	---	20-40	Soft	Moderate	Moderate	High.

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Bedrock: Depth	Bedrock: Hardness	Potential frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft			In				
ExC*, ExD*:												
Evard------------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	High.
Cowee------------	B	None--------	---	---	>6.0	---	---	20-40	Soft	Moderate	Moderate	High.
Urban land.												
FaC, FaD, FaE, FaF-------------- Fannin	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
HaB2, HaC2, HaD2-- Hayesville	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
HmA--------------- Hemphill	D	Rare--------	---	---	0-1.0	Apparent	Nov-May	>60	---	High-----	High-----	High.
NkA--------------- Nikwasi	B/D	Frequent----	Very brief	Jan-Dec	0-1.0	Apparent	Nov-May	>60	---	Moderate	High-----	High.
OwE--------------- Oconaluftee	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.
PwC, PwD, PwE, PwF-------------- Plott	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.
ReA--------------- Reddies	B	Frequent----	Very brief	Jan-Dec	2.0-3.5	Apparent	Dec-Apr	>60	---	Low------	Low------	Moderate.
RhF*:												
Rock outcrop.												
Cataska----------	D	None--------	---	---	>6.0	---	---	10-20	Soft	Moderate	Low------	Moderate.
RkF*:												
Rock outcrop.												
Cleveland--------	C	None--------	---	---	>6.0	---	---	10-20	Hard	Moderate	Low------	High.
RsA--------------- Rosman	B	Frequent----	Very brief	Dec-Apr	2.5-5.0	Apparent	Jan-Apr	>60	---	Moderate	Moderate	Moderate.
SbC, SbD, SbE, ScB, ScC--------- Saunook	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro- logic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
SoD*, SoE*, SoF*:												
Soco-------------	B	None---------	---	---	>6.0	---	---	20-40	Soft	Moderate	Moderate	High.
Stecoah----------	B	None---------	---	---	>6.0	---	---	40-60	Soft	Moderate	Moderate	High.
SrC*, SrD*, SrE*:												
Spivey-----------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Low------	Moderate.
Santeetlah-------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.
StB--------------- Statler	B	Rare---------	---	---	>6.0	---	---	>60	---	Moderate	Low------	Moderate.
SxE*:												
Sylco------------	C	None---------	---	---	>6.0	---	---	20-40	Hard	Moderate	Low------	Moderate.
Cataska----------	D	None---------	---	---	>6.0	---	---	10-20	Soft	Moderate	Low------	Moderate.
SyA*:												
Sylva------------	B/D	None---------	---	---	0-1.0	Apparent	Nov-May	>60	---	High-----	High-----	High.
Whiteside--------	B	None---------	---	---	1.5-3.0	Apparent	Nov-May	>60	---	Moderate	Moderate	High.
ToA--------------- Toxaway	B/D	Frequent----	Very brief	Nov-Mar	0-1.0	Apparent	Nov-Apr	>60	---	High-----	High-----	Moderate.
TrE, TrF---------- Trimont	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.
TsC*:												
Tuckasegee-------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	High-----	High.
Cullasaja--------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	High-----	High.
TwB*, TwC*:												
Tuckasegee-------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	High-----	High.
Whiteside--------	B	None---------	---	---	1.5-3.0	Apparent	Nov-May	>60	---	Moderate	Moderate	High.
Ud. Udorthents												
UfB*:												
Udorthents.												
Urban land.												

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
WeC, WeD, WeE, WeF--------------- Wayah	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--ENGINEERING INDEX TEST DATA

(Dashes indicate that data were not available. LL means liquid limit; PI, plasticity index; MD, maximum dry density; OM, optimum moisture; and NP, nonplastic. The soils are the typical pedons for the soil series in the survey area. For the location of the pedons see "Soil Series and Their Morphology")

Soil name, report number, horizon, and depth in inches	Classification: AASHTO	Classification: Unified	Grain-size distribution, Percentage passing sieve--: 3 in.	2 in.	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	Percentage smaller than--: .02 mm	.005 mm	.002 mm	LL	PI	Moisture density: MD	OM
														Pct		Lb/ cu ft	Pct
Braddock clay loam: (S85NC-113-001)																	
Ap--------0 to 11	A-7-6(16)	CL		100	98	96	95	95	89	68	56	42	35	48	26	105	19
Bt1------11 to 21	A-7-5(23)	MH		100	98	98	97	97	92	77	71	58	54	63	27	92	28
Bt2------21 to 31	A-7-5(10)	MH						100	95	76	63	50	44	66	18	92	27
BC-------43 to 57	A-7-5(14)	MH						100	94	67	53	36	31	64	18	94	27
Cheoah channery loam: (S85NC-113-002)																	
A1--------0 to 6	A-5(0)	SM		100	96	95	89	88	70	43	23	7	4	55	NP	---	---
A2--------6 to 13	A-5(0)	MH		100	98	97	95	94	79	51	28	9	5	51	NP	---	---
Bw-------13 to 43	A-4(1)	ML			100	98	98	98	84	52	32	22	16	34	7	105	19
Evard fine sandy loam: (S85NC-113-004)																	
A---------0 to 5	A-4(0)	SM		100	99	99	97	93	82	48	32	13	8	31	NP	94	24
Bt--------8 to 35	A-4(2)	ML						100	88	52	35	24	21	34	10	109	18
C--------45 to 61	A-2-4(0)	SM						100	81	32	18	10	9	25	NP	113	17
Fannin fine sandy loam: (S85NC-113-005)																	
A---------0 to 4	A-2-5(0)	SM		100	99	95	92	86	63	34	30	21	15	50	NP	94	26
Bt--------7 to 21	A-7-5(4)	SM			100	98	97	92	67	45	43	32	27	50	16	103	20
C--------27 to 60	A-2-5(0)	SM					100	98	66	29	15	11	8	51	NP	94	24
Rosman fine sandy loam: (S85NC-113-008)																	
Ap--------0 to 16	A-2-4(0)	SM						100	99	33	16	8	5	28	NP	101	20
Bw-------16 to 57	A-4(0)	SM						100	100	40	21	13	7	28	NP	102	20
C--------57 to 60	A-4(2)	ML						100	100	54	34	22	17	33	8	103	21
Soco channery fine sandy loam: (S85NC-113-011)																	
A---------0 to 5	A-4(0)	SM		100	98	91	85	82	65	43	25	13	5	39	NP	98	22
Bw--------5 to 22	A-6(3)	CL		100	99	93	90	90	76	51	32	17	11	33	11	108	18

TABLE 17.--ENGINEERING INDEX TEST DATA--Continued

Soil name, report number, horizon, and depth in inches	Classification		Grain-size distribution											LL	PI	Moisture density	
			Percentage passing sieve--								Percentage smaller than--						
	AASHTO	Unified	3 in.	2 in.	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm			MD	OM
														Pct		Lb/ cu ft	Pct
Statler fine sandy loam: (S85NC-113-9)																	
Ap--------0 to 10	A-4(1)	ML						100	97	53	35	17	10	33	7	103	19
Bt--------10 to 50	A-7-6(16)	CL						100	98	70	52	36	31	42	27	103	21
BC--------50 to 60	A-7-5(9)	ML						100	96	62	44	35	29	46	16	98	23

TABLE 18.--CLASSIFICATION OF THE SOILS

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series)

Soil name	Family or higher taxonomic class
Arkaqua	Fine-loamy, mixed, mesic Fluvaquentic Dystrochrepts
Biltmore	Mixed, mesic Typic Udipsamments
Braddock	Clayey, mixed, mesic Typic Hapludults
Brasstown	Fine-loamy, mixed, mesic Typic Hapludults
Burton	Coarse-loamy, mixed, frigid Typic Haplumbrepts
Cashiers	Coarse-loamy, micaceous, mesic Umbric Dystrochrepts
Cataska	Loamy-skeletal, mixed, mesic, shallow Typic Dystrochrepts
Chandler	Coarse-loamy, micaceous, mesic Typic Dystrochrepts
Cheoah	Coarse-loamy, mixed, mesic Typic Haplumbrepts
Chestnut	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Cleveland	Loamy, mixed, mesic Lithic Dystrochrepts
Cowee	Fine-loamy, mixed, mesic Typic Hapludults
Craggey	Loamy, mixed, frigid Lithic Haplumbrepts
Cullasaja	Loamy-skeletal, mixed, mesic Typic Haplumbrepts
Dellwood	Sandy-skeletal, mixed, mesic Fluventic Haplumbrepts
Dillard	Fine-loamy, mixed, mesic Aquic Hapludults
Dillsboro	Clayey, mixed, mesic Humic Hapludults
Edneyville	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Evard	Fine-loamy, oxidic, mesic Typic Hapludults
Fannin	Fine-loamy, micaceous, mesic Typic Hapludults
Hayesville	Clayey, kaolinitic, mesic Typic Kanhapludults
Hemphill	Fine, mixed, mesic Typic Umbraqualfs
Junaluska	Fine-loamy, mixed, mesic Typic Hapludults
*Nikwasi	Coarse-loamy over sandy or sandy-skeletal, mixed, nonacid, mesic Cumulic Humaquepts
Oconaluftee	Coarse-loamy, mixed, frigid Typic Haplumbrepts
Plott	Coarse-loamy, mixed, mesic Typic Haplumbrepts
Reddies	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Fluventic Haplumbrepts
Rosman	Coarse-loamy, mixed, mesic Fluventic Haplumbrepts
Santeetlah	Coarse-loamy, mixed, mesic Typic Haplumbrepts
Saunook	Fine-loamy, mixed, mesic Humic Hapludults
Soco	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Spivey	Loamy-skeletal, mixed, mesic Typic Haplumbrepts
*Statler	Fine-loamy, mixed, mesic Humic Hapludults
Stecoah	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Sylco	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Sylva	Coarse-loamy, mixed, acid, mesic Humic Haplaquepts
Toxaway	Fine-loamy, mixed, nonacid, mesic Cumulic Humaquepts
Trimont	Fine-loamy, mixed, mesic Humic Hapludults
Tuckasegee	Fine-loamy, mixed, mesic Typic Haplumbrepts
Udorthents	Udorthents
Wayah	Coarse-loamy, mixed, frigid Typic Haplumbrepts
Whiteside	Fine-loamy, mixed, mesic Aquic Hapludults

☆ U S GOVERNMENT PRINTING OFFICE : 1996—404-327/20523/SCS

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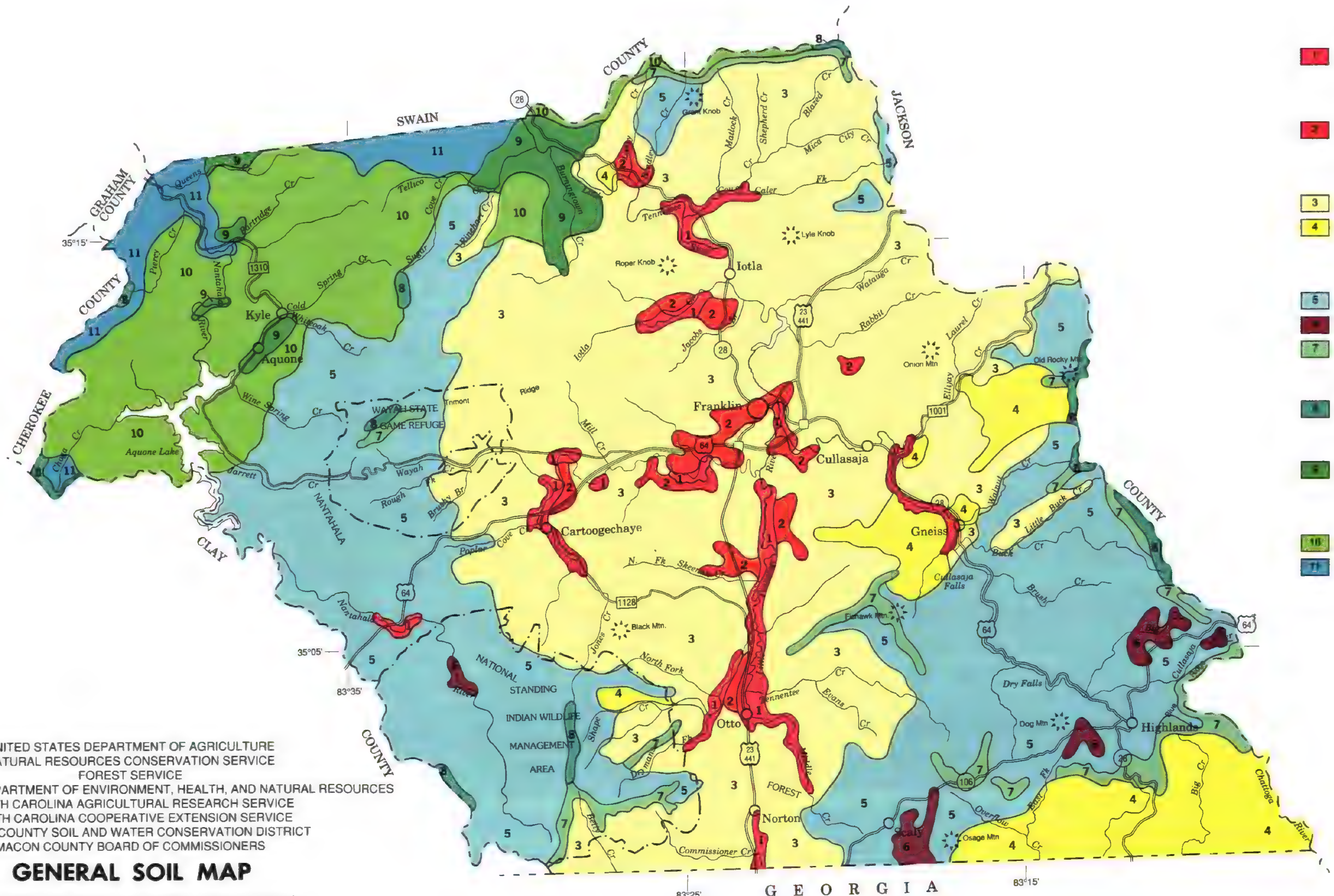
Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.



SOIL LEGEND*

LOAMY SOILS THAT FORMED IN ALLUVIUM; ON FLOOD PLAINS

1 Rosman-Reddies-Toxaway

PREDOMINANTLY CLAYEY SOILS THAT FORMED IN MATERIAL WEATHERED FROM HIGH-GRADE METAMORPHIC ROCKS OR OLD ALLUVIUM; ON LOW, ROLLING HILLS

2 Hayesville-Braddock

LOAMY SOILS THAT FORMED IN MATERIAL WEATHERED FROM HIGH-GRADE METAMORPHIC ROCKS OR IN COLLUVIUM; PREDOMINANTLY IN LOW MOUNTAINS

3 Evard-Cowee-Saunook

4 Fannin-Chandler

ROCK OUTCROP AND LOAMY SOILS THAT FORMED IN MATERIAL WEATHERED FROM HIGH-GRADE METAMORPHIC OR IGNEOUS ROCKS OR IN COLLUVIUM; PREDOMINANTLY IN INTERMEDIATE MOUNTAINS

5 Edneyville-Plott-Chestnut-Cullasaja

6 Edneyville-Tuckasegee-Chestnut

7 Cleveland-Rock outcrop-Chestnut

LOAMY SOILS THAT FORMED IN MATERIAL WEATHERED FROM HIGH-GRADE METAMORPHIC OR IGNEOUS ROCKS; IN HIGH MOUNTAINS

8 Wayah-Burton-Craggey

LOAMY SOILS THAT FORMED IN MATERIAL WEATHERED FROM METASEDIMENTARY ROCKS; PREDOMINANTLY IN LOW MOUNTAINS

9 Brasstown-Junaluska

LOAMY SOILS THAT FORMED IN MATERIAL WEATHERED FROM METASEDIMENTARY ROCKS OR IN COLLUVIUM; IN LOW AND INTERMEDIATE MOUNTAINS

10 Soco-Stecoah-Cheoah-Spivey

11 Cataska-Sylco-Cheoah-Spivey

* The units on this legend are described in the text under the heading "General Soil Map Units."

Compiled 1995

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
FOREST SERVICE
NORTH CAROLINA DEPARTMENT OF ENVIRONMENT, HEALTH, AND NATURAL RESOURCES
NORTH CAROLINA AGRICULTURAL RESEARCH SERVICE
NORTH CAROLINA COOPERATIVE EXTENSION SERVICE
MACON COUNTY SOIL AND WATER CONSERVATION DISTRICT
MACON COUNTY BOARD OF COMMISSIONERS

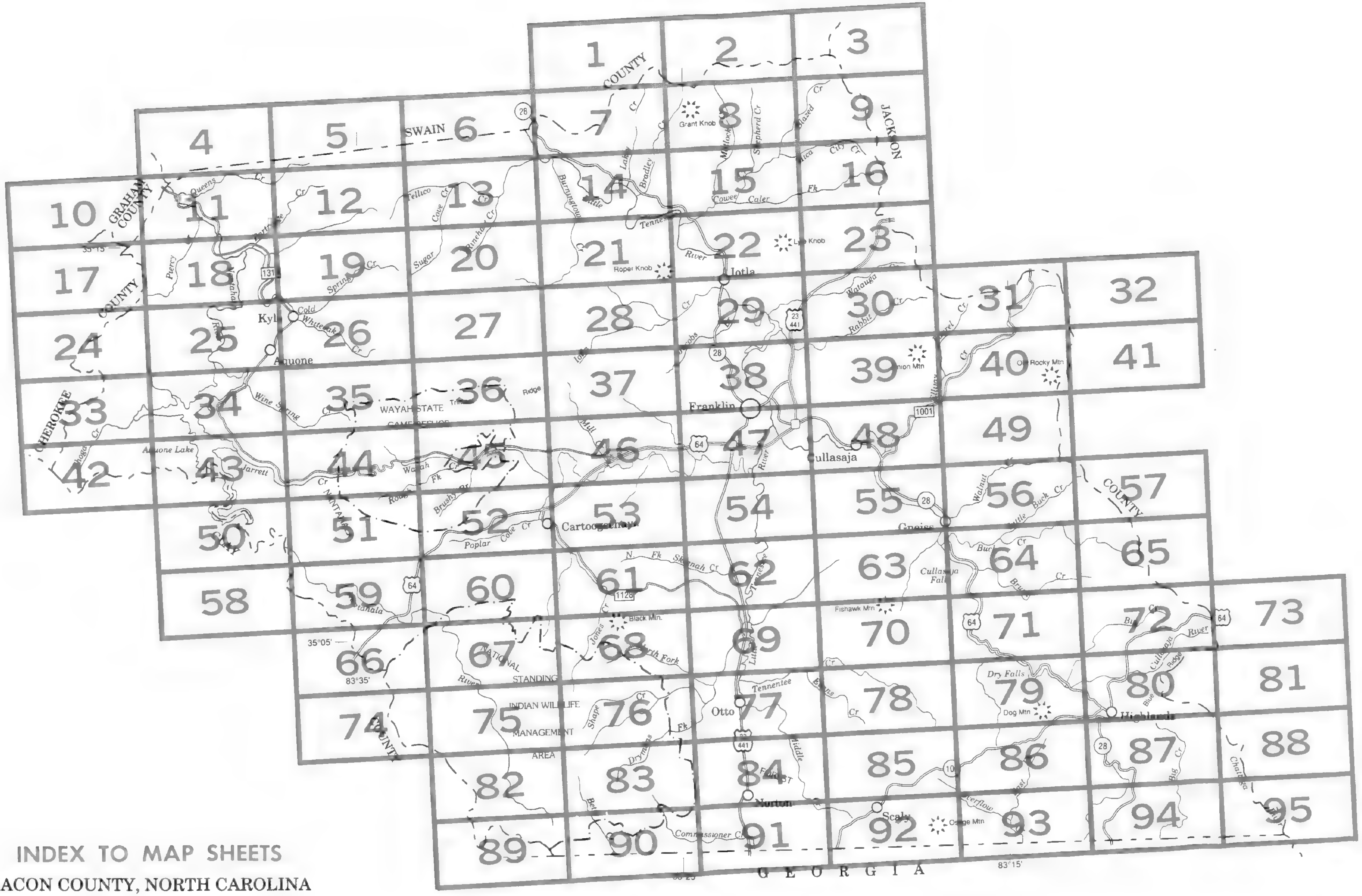
GENERAL SOIL MAP

MACON COUNTY, NORTH CAROLINA

Scale 1:190,080

1 0 1 2 3 Mi

1 0 3 6 Km



INDEX TO MAP SHEETS

MACON COUNTY, NORTH CAROLINA

Scale 1:190,080

1 0 1 2 3 Mi

1 0 3 6 Km

SOIL LEGEND

Map symbols and names are alphabetical. Map symbols are letters or a combination of letters and a number. The first letter is capitalized and is the first letter of the series (or higher level of classification) name. The second letter is lowercase. The third letter is capitalized and denotes the slope phase. The number 2 at the end of a map unit symbol denotes a moderately eroded phase.

SYMBOL	NAME
ArA	Arkaqua loam, 0 to 2 percent slopes, frequently flooded
BeA	Biltmore sandy loam, 0 to 3 percent slopes, frequently flooded
BkB2	Braddock clay loam, 2 to 8 percent slopes, eroded
BkC2	Braddock clay loam, 8 to 15 percent slopes, eroded
BrC	Braddock-Urban land complex, 2 to 15 percent slopes
BrD	Braddock-Urban land complex, 15 to 30 percent slopes
BsC	Brasstown-Junaluska complex, 8 to 15 percent slopes
BsD	Brasstown-Junaluska complex, 15 to 30 percent slopes
BsE	Brasstown-Junaluska complex, 30 to 50 percent slopes
BsF	Brasstown Junaluska complex, 50 to 95 percent slopes
BuD	Burton-Craggey-Rock outcrop complex, windswept, 15 to 30 percent slopes, stony
BuF	Burton-Craggey-Rock outcrop complex, windswept, 30 to 95 percent slopes, stony
CaE	Cashiers gravelly fine sandy loam, 30 to 50 percent slopes
CaF	Cashiers gravelly fine sandy loam, 50 to 95 percent slopes
CcF	Cataska-Sylco complex, 50 to 95 percent slopes
CdD	Chandler gravelly fine sandy loam, 15 to 30 percent slopes
CdE	Chandler gravelly fine sandy loam, 30 to 50 percent slopes
CdF	Chandler gravelly fine sandy loam, 50 to 95 percent slopes
ChE	Cheoah channery loam, 30 to 50 percent slopes
ChF	Cheoah channery loam, 50 to 95 percent slopes
CnC	Chestnut-Edneyville complex, windswept, 8 to 15 percent slopes, stony
CnD	Chestnut-Edneyville complex, windswept, 15 to 30 percent slopes, stony
CnE	Chestnut-Edneyville complex, windswept, 30 to 50 percent slopes, stony
CpD	Cleveland-Chestnut-Rock outcrop complex, windswept, 15 to 30 percent slopes
CpE	Cleveland-Chestnut-Rock outcrop complex, windswept, 30 to 50 percent slopes
CpF	Cleveland-Chestnut-Rock outcrop complex, windswept, 50 to 95 percent slopes
CsD	Cullasaja very cobbly fine sandy loam, 15 to 30 percent slopes, extremely bouldery
CsE	Cullasaja very cobbly fine sandy loam, 30 to 50 percent slopes, extremely bouldery
CuD	Cullasaja-Tuckasegee complex, 15 to 30 percent slopes, stony
CuE	Cullasaja Tuckasegee complex, 30 to 50 percent slopes, stony
CuF	Cullasaja-Tuckasegee complex, 50 to 95 percent slopes, stony
DgB	Dellwood gravelly fine sandy loam, 0 to 5 percent slopes, frequently flooded
DrB	Dillard loam, 1 to 5 percent slopes, rarely flooded
DsB	Dillsboro loam, 2 to 8 percent slopes
DsC	Dillsboro loam, 8 to 15 percent slopes
EdB	Edneyville-Chestnut complex, 2 to 8 percent slopes, stony
EdC	Edneyville-Chestnut complex, 8 to 15 percent slopes, stony
EdD	Edneyville-Chestnut complex, 15 to 30 percent slopes, stony
EdE	Edneyville-Chestnut complex, 30 to 50 percent slopes, stony
EdF	Edneyville-Chestnut complex, 50 to 95 percent slopes, stony
EeC	Edneyville-Chestnut-Urban land complex, 2 to 15 percent slopes
EeD	Edneyville-Chestnut-Urban land complex, 15 to 30 percent slopes
EvB	Evard-Cowee complex, 2 to 8 percent slopes
EvC	Evard-Cowee complex, 8 to 15 percent slopes
EvD	Evard-Cowee complex, 15 to 30 percent slopes
EvE	Evard-Cowee complex, 30 to 50 percent slopes
EvF	Evard-Cowee complex, 50 to 95 percent slopes
ExC	Evard-Cowee-Urban land complex, 8 to 15 percent slopes
ExD	Evard-Cowee-Urban land complex, 15 to 30 percent slopes

SYMBOL	NAME
FaC	Fannin fine sandy loam, 8 to 15 percent slopes
FaD	Fannin fine sandy loam, 15 to 30 percent slopes
FaE	Fannin fine sandy loam, 30 to 50 percent slopes
FaF	Fannin fine sandy loam, 50 to 95 percent slopes
HaB2	Hayesville clay loam, 2 to 8 percent slopes, eroded
HaC2	Hayesville clay loam, 8 to 15 percent slopes, eroded
HaD2	Hayesville clay loam, 15 to 30 percent slopes, eroded
HmA	Hemphill loam, 0 to 3 percent slopes, rarely flooded
NkA	Nikwasi fine sandy loam, 0 to 2 percent slopes, frequently flooded
OwE	Oconaluftee channery loam, windswept, 30 to 50 percent slopes
PwC	Plott fine sandy loam, 8 to 15 percent slopes, stony
PwD	Plott fine sandy loam, 15 to 30 percent slopes, stony
PwE	Plott fine sandy loam, 30 to 50 percent slopes, stony
PwF	Plott fine sandy loam, 50 to 95 percent slopes, stony
ReA	Reddies fine sandy loam, 0 to 3 percent slopes, frequently flooded
RhF	Rock outcrop-Cataska complex, 30 to 95 percent slopes
RkF	Rock outcrop-Cleveland complex, windswept, 30 to 95 percent slopes
RsA	Rosman fine sandy loam, 0 to 2 percent slopes, frequently flooded
SbC	Saunook gravelly loam, 8 to 15 percent slopes, stony
SbD	Saunook gravelly loam, 15 to 30 percent slopes, stony
SbE	Saunook gravelly loam, 30 to 50 percent slopes, stony
ScB	Saunook loam, 2 to 8 percent slopes
ScC	Saunook loam, 8 to 15 percent slopes
SoD	Soco-Stecoah complex, 15 to 30 percent slopes
SoE	Soco-Stecoah complex, 30 to 50 percent slopes
SoF	Soco-Stecoah complex, 50 to 95 percent slopes
SrC	Spivey-Santeetlah complex, 8 to 15 percent slopes, stony
SrD	Spivey-Santeetlah complex, 15 to 30 percent slopes, stony
SrE	Spivey-Santeetlah complex, 30 to 50 percent slopes, stony
StB	Statler fine sandy loam, 1 to 5 percent slopes, rarely flooded
SxE	Sylco-Cataska complex, 30 to 50 percent slopes
SyA	Sylva-Whiteside complex, 0 to 3 percent slopes
ToA	Toxaway loam, 0 to 2 percent slopes, frequently flooded
TrE	Trimont gravelly loam, 30 to 50 percent slopes, stony
TrF	Trimont gravelly loam, 50 to 95 percent slopes, stony
TsC	Tuckasegee-Cullasaja complex, 8 to 15 percent slopes, stony
TwB	Tuckasegee-Whiteside complex, 2 to 8 percent slopes
TwC	Tuckasegee-Whiteside complex, 8 to 15 percent slopes
Ud	Udorthents, loamy
UfB	Udorthents-Urban land complex, 0 to 5 percent slopes, rarely flooded
WeC	Wayah sandy loam, windswept, 8 to 15 percent slopes, stony
WeD	Wayah sandy loam, windswept, 15 to 30 percent slopes, stony
WeE	Wayah sandy loam, windswept, 30 to 50 percent slopes, stony
WeF	Wayah sandy loam, windswept, 50 to 95 percent slopes, stony

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state, or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline and neatline

AD HOC BOUNDARY (label)

- Small airport, airfield, park, oilfield, cemetery, or flood pool

STATE COORDINATE TICK
1 890 000 FEET

LAND DIVISION CORNER
(sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEM & DESIGNATIONS

- Interstate
- Federal
- State
- County, farm or ranch

RAILROAD

POWER TRANSMISSION LINE
(normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or Small
(Named where applicable)

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban area) (occupied)
- Church
- School
- Indian mound (label)
- Located object (label)
- Tank (label)
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label)
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial
- Intermittent

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

GULLY

DEPRESSION OR SINK

SOIL SAMPLE (normally not shown)

MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot

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MACON COUNTY, NORTH CAROLINA NO. 1

660 000 FEET
610 000 FEET

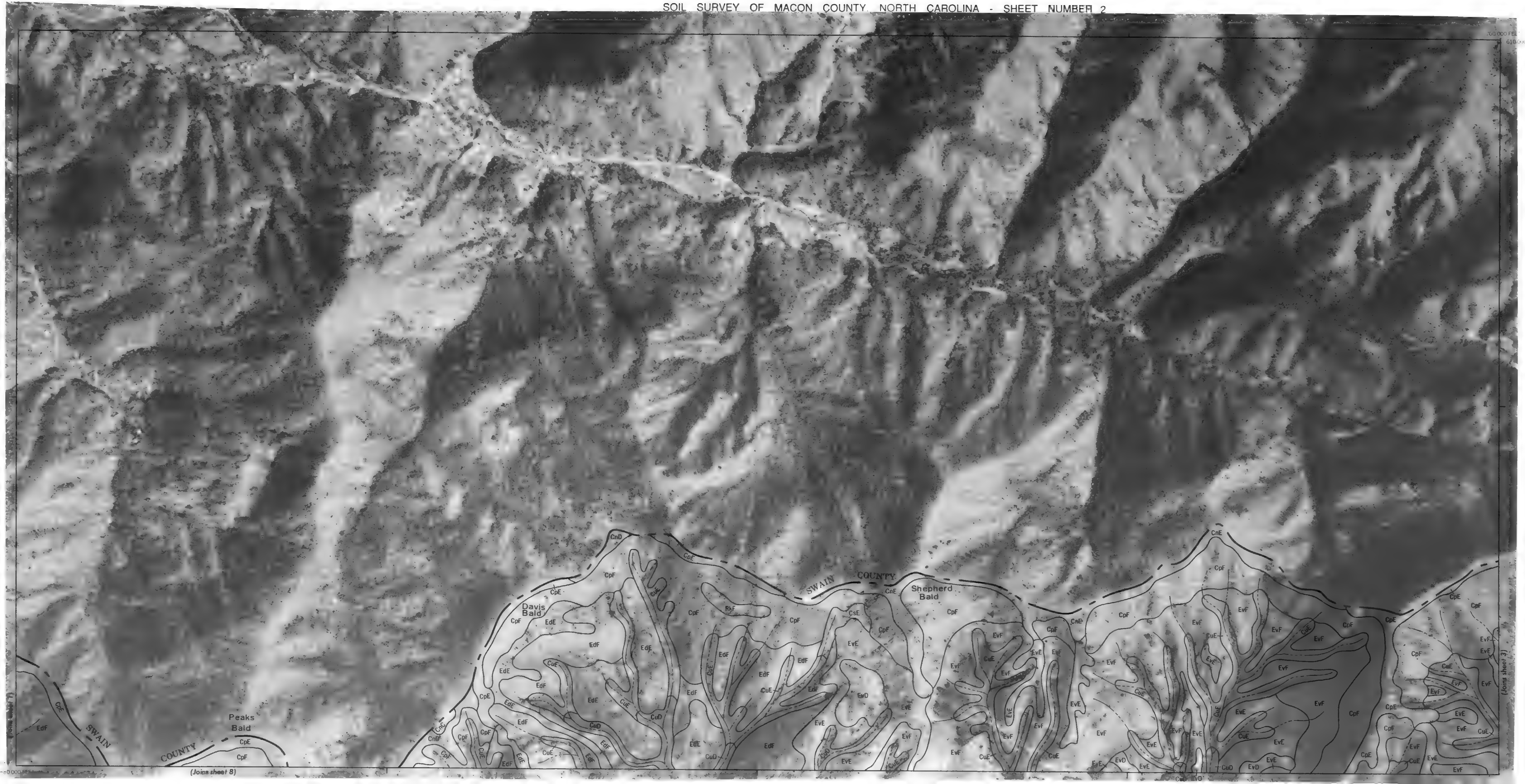
1
N

SCALE 1:12 000
3000 FEET
1000 METERS
1 KILOMETER

2

N

SCALE 1:12 000



MACON COUNTY, NORTH CAROLINA NO. 2

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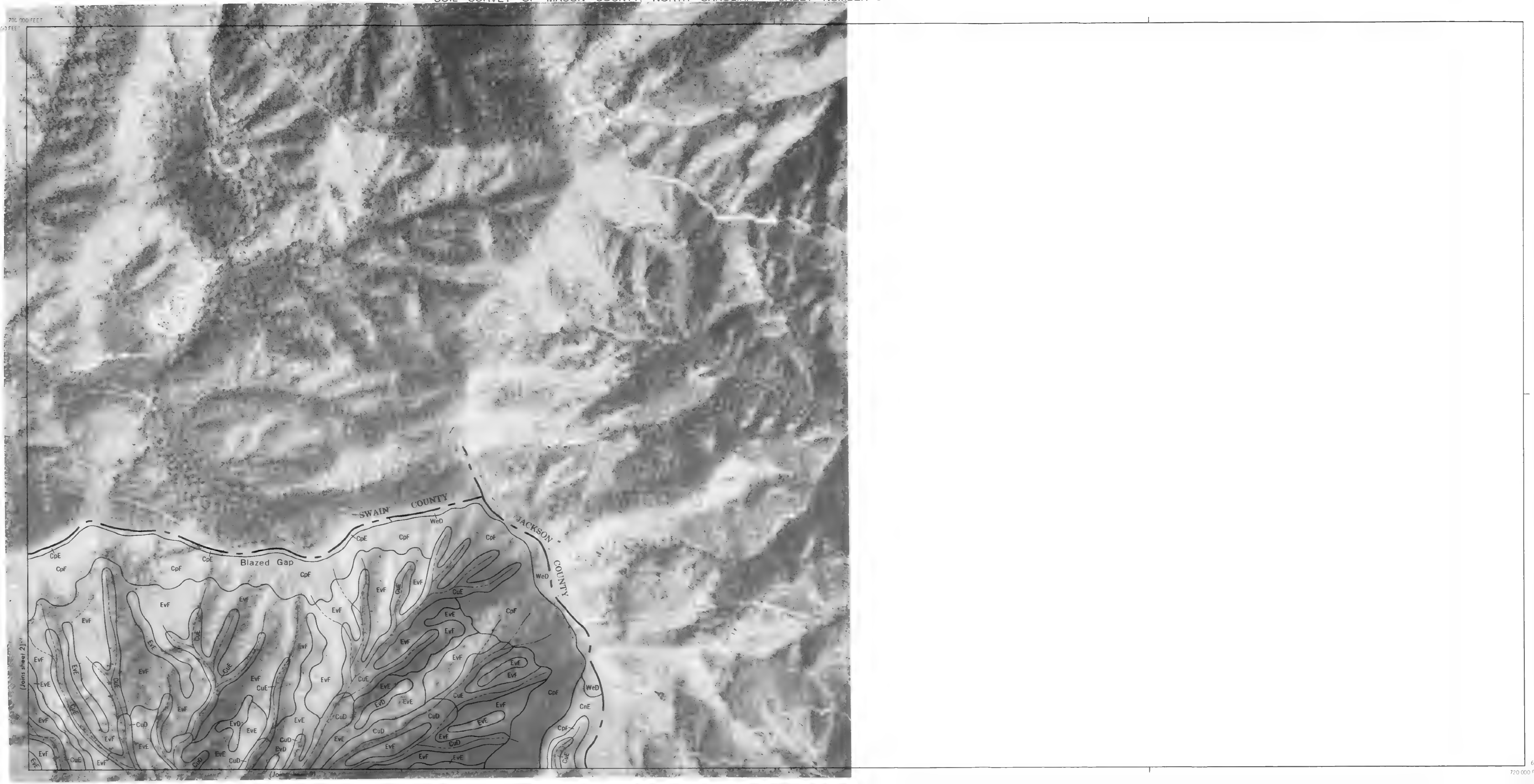
MACON COUNTY, NORTH CAROLINA NO. 3



N

SCALE 1:12 000

1 KILOMETER

3000 FEET

1000 METERS

SOIL SURVEY OF MACON COUNTY, NORTH CAROLINA - SHEET NUMBER 4

MACON COUNTY, NORTH CAROLINA NO. 4

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SOIL SURVEY OF MACON COUNTY, NORTH CAROLINA - SHEET NUMBER 5

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MACON COUNTY, NORTH CAROLINA NO. 5

MACON COUNTY, NORTH CAROLINA NO. 6

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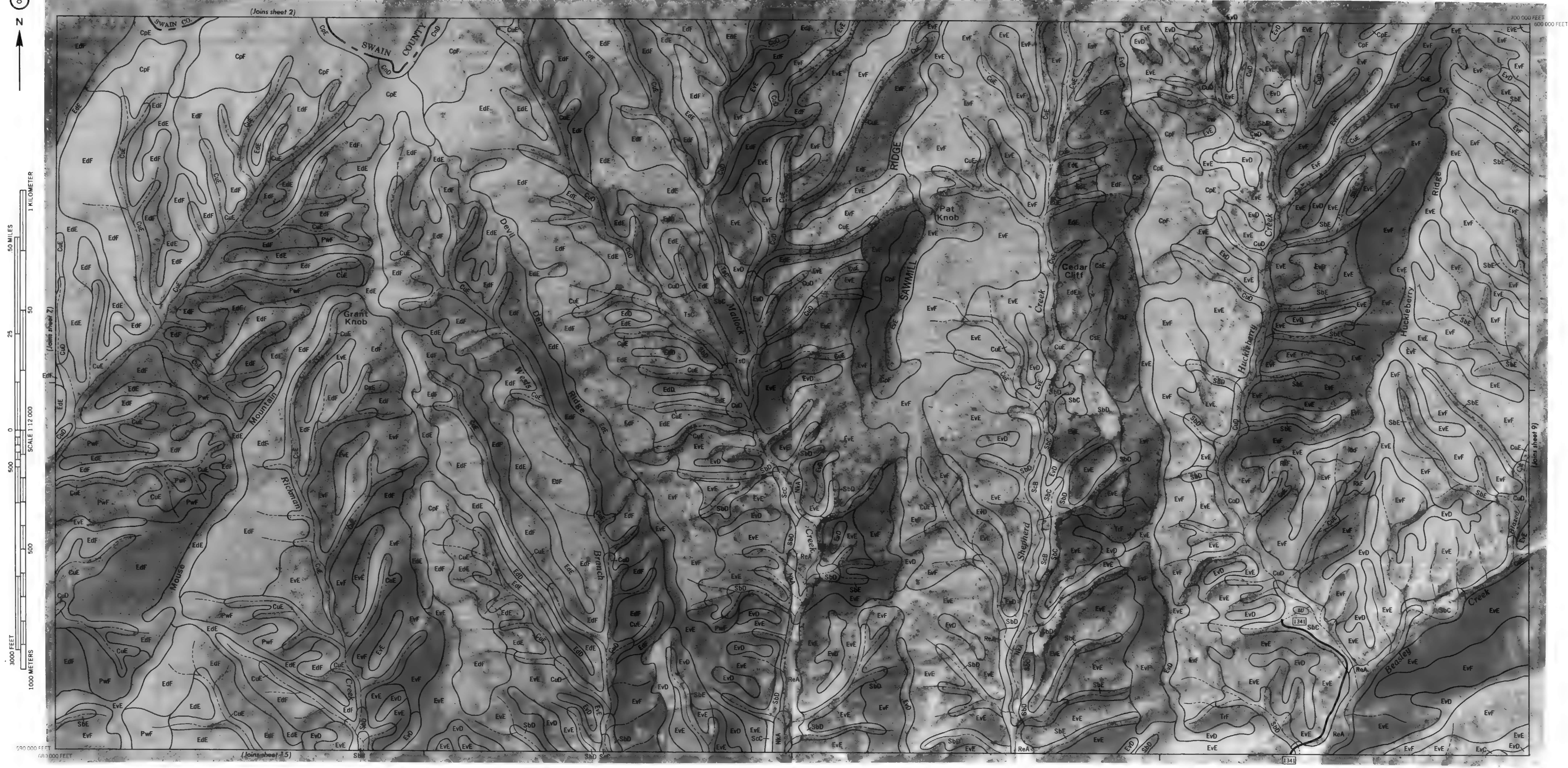
MACON COUNTY, NORTH CAROLINA NO. 7



MACON COUNTY, NORTH CAROLINA NO. 8

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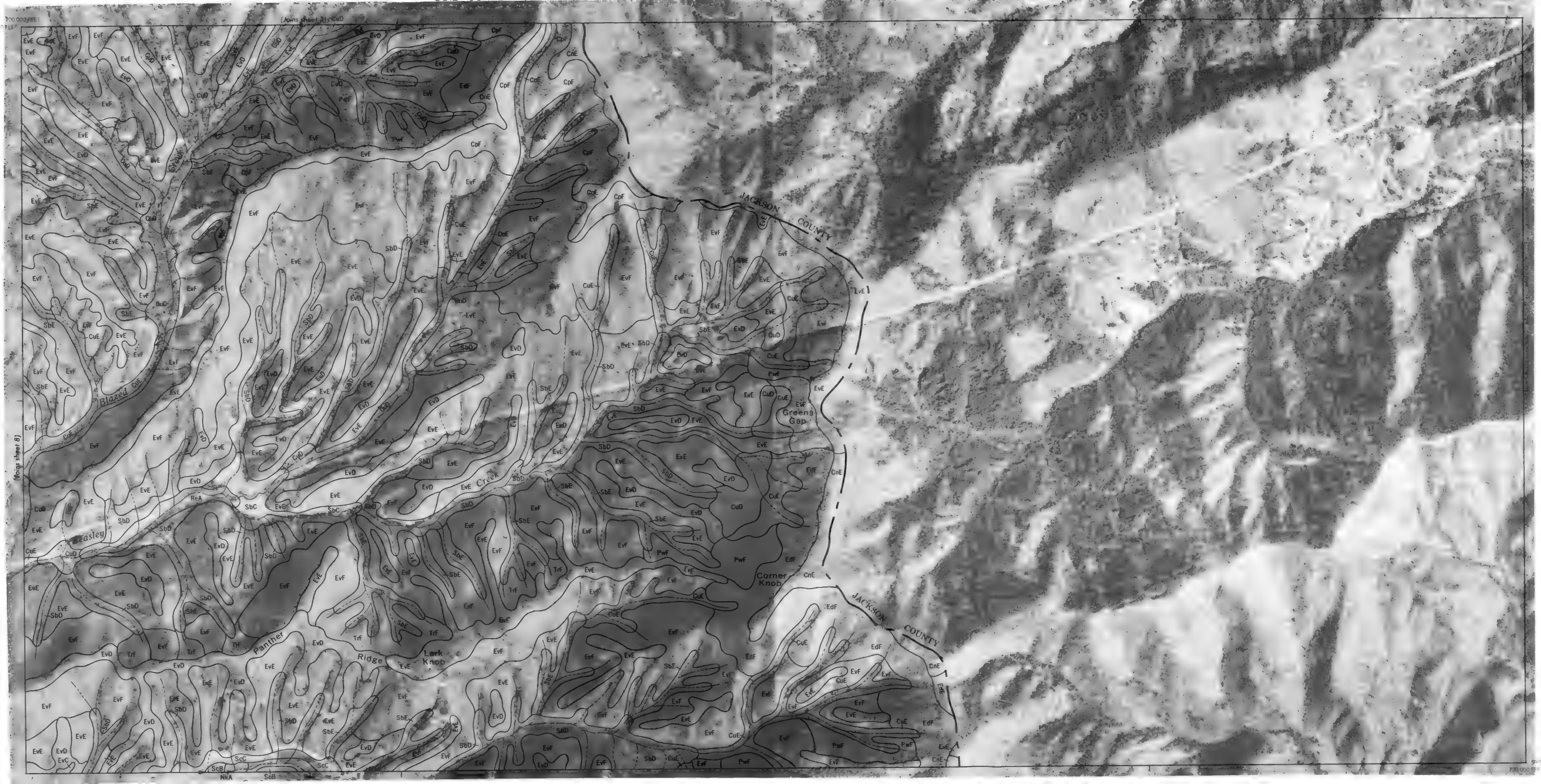
MACON COUNTY, NORTH CAROLINA NO. 9



9

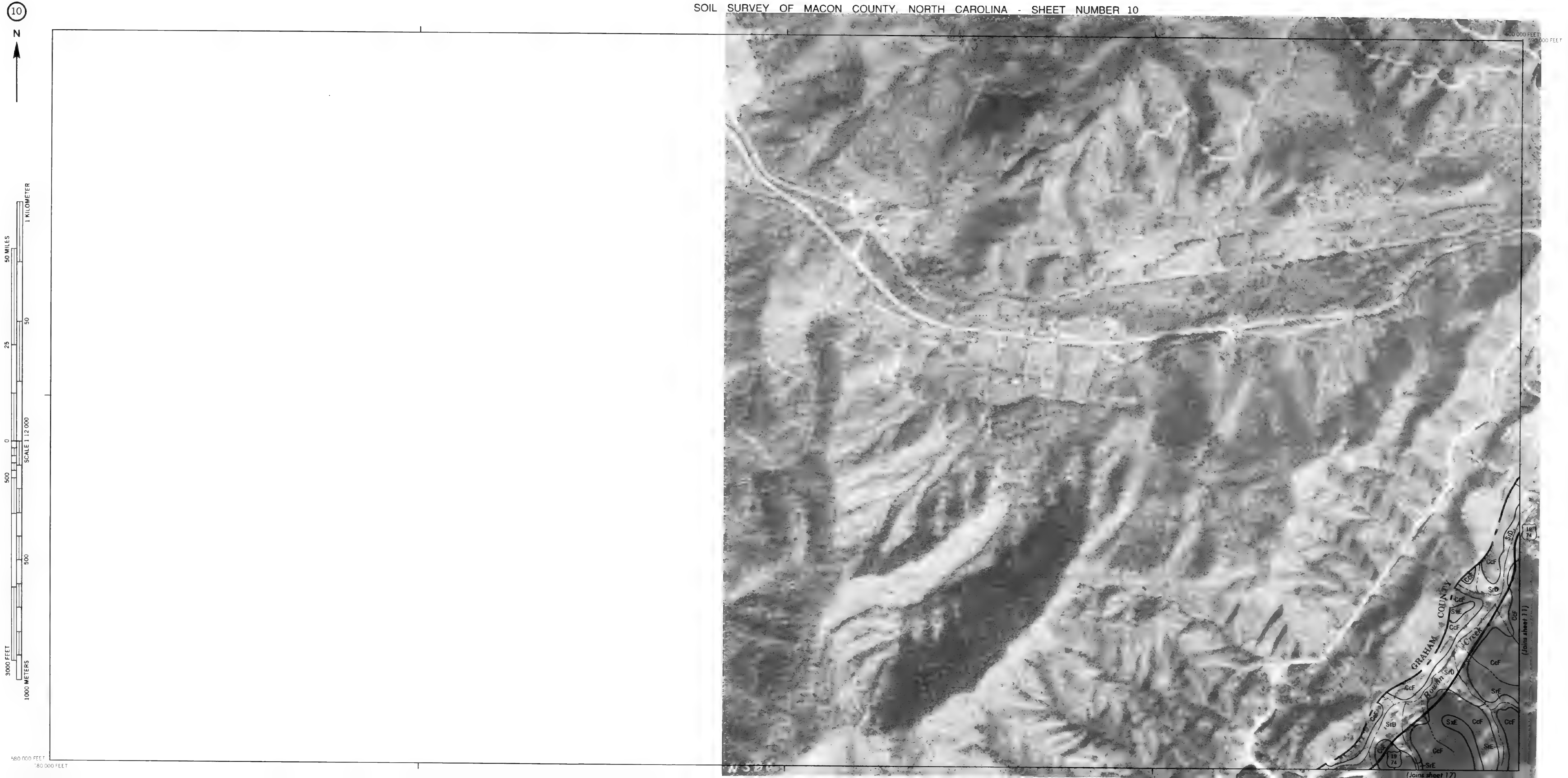
N

1 KILOMETER

SCALE 1:12 000

3000 FEET

1000 METERS



MACON COUNTY, NORTH CAROLINA NO. 10

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MACON COUNTY, NORTH CAROLINA NO. 11

SOIL SURVEY OF MACON COUNTY, NORTH CAROLINA - SHEET NUMBER 12

MACON COUNTY, NORTH CAROLINA NO. 12

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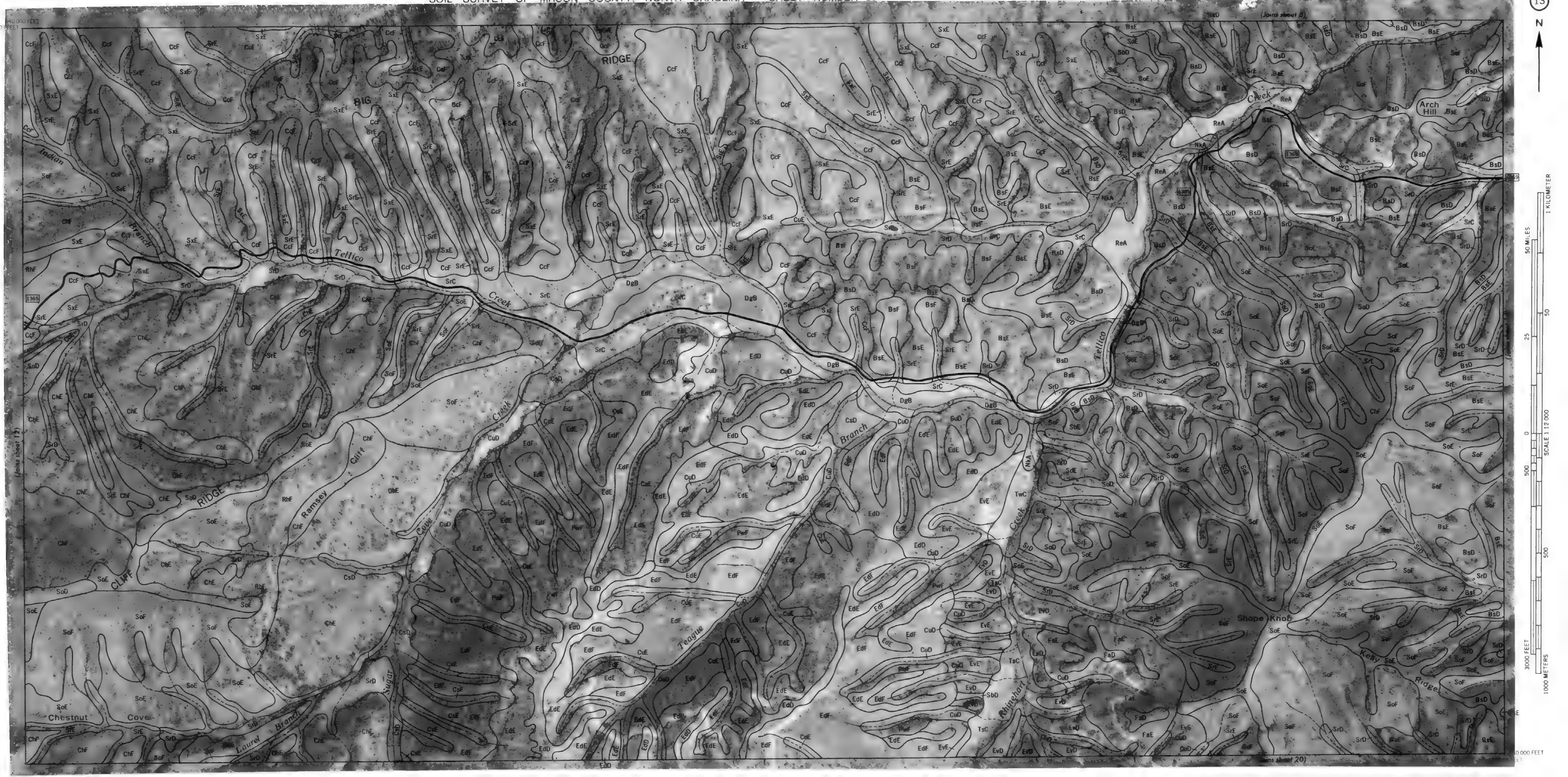
MACON COUNTY, NORTH CAROLINA NO. 13



MACON COUNTY, NORTH CAROLINA NO. 14

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MACON COUNTY, NORTH CAROLINA NO. 15

SOIL SURVEY OF MACON COUNTY, NORTH CAROLINA - SHEET NUMBER 16

MACON COUNTY, NORTH CAROLINA NO. 16

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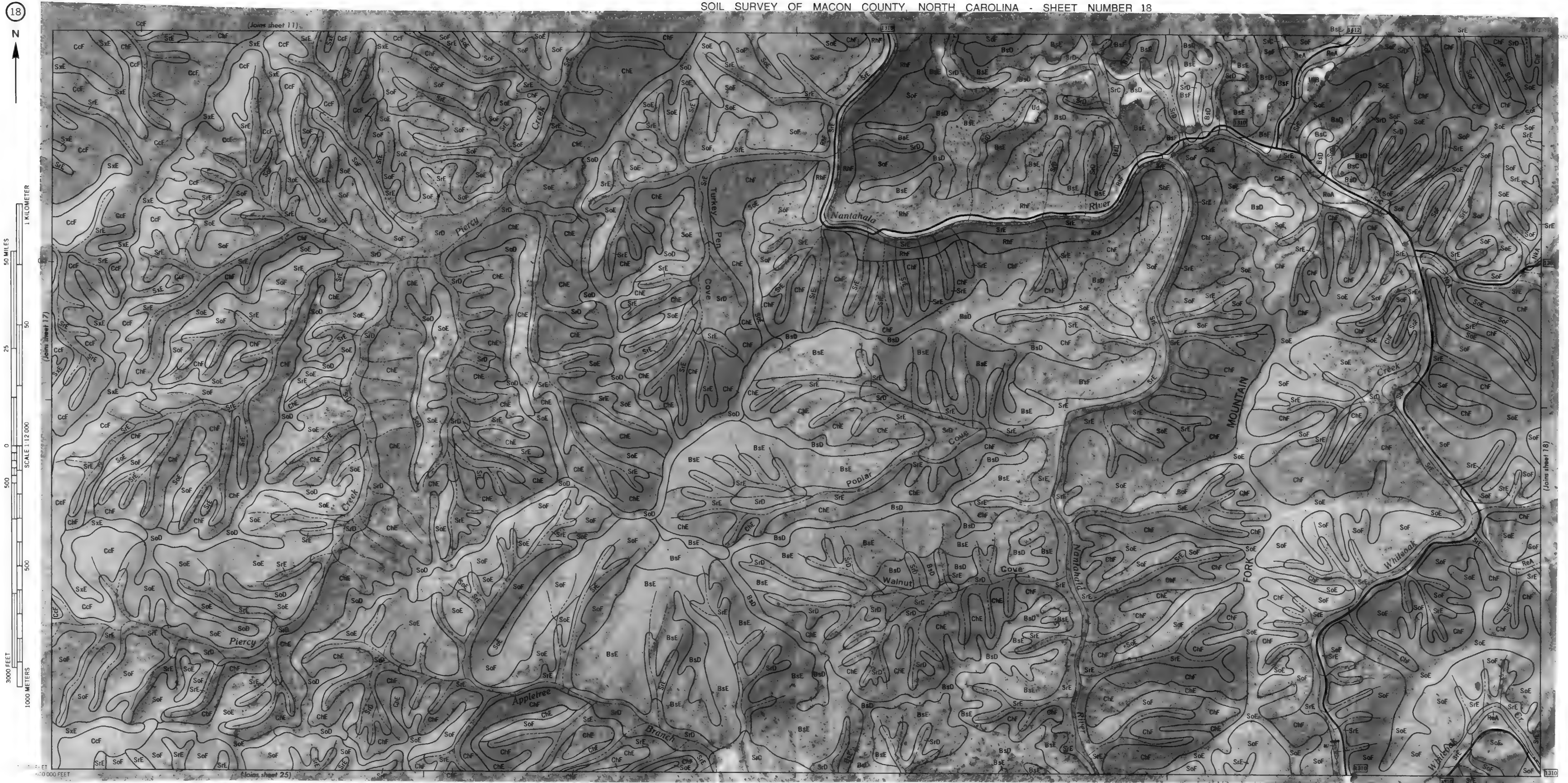
MACON COUNTY, NORTH CAROLINA NO. 17

SOIL SURVEY OF MACON COUNTY, NORTH CAROLINA - SHEET NUMBER 18



MACON COUNTY, NORTH CAROLINA NO. 18

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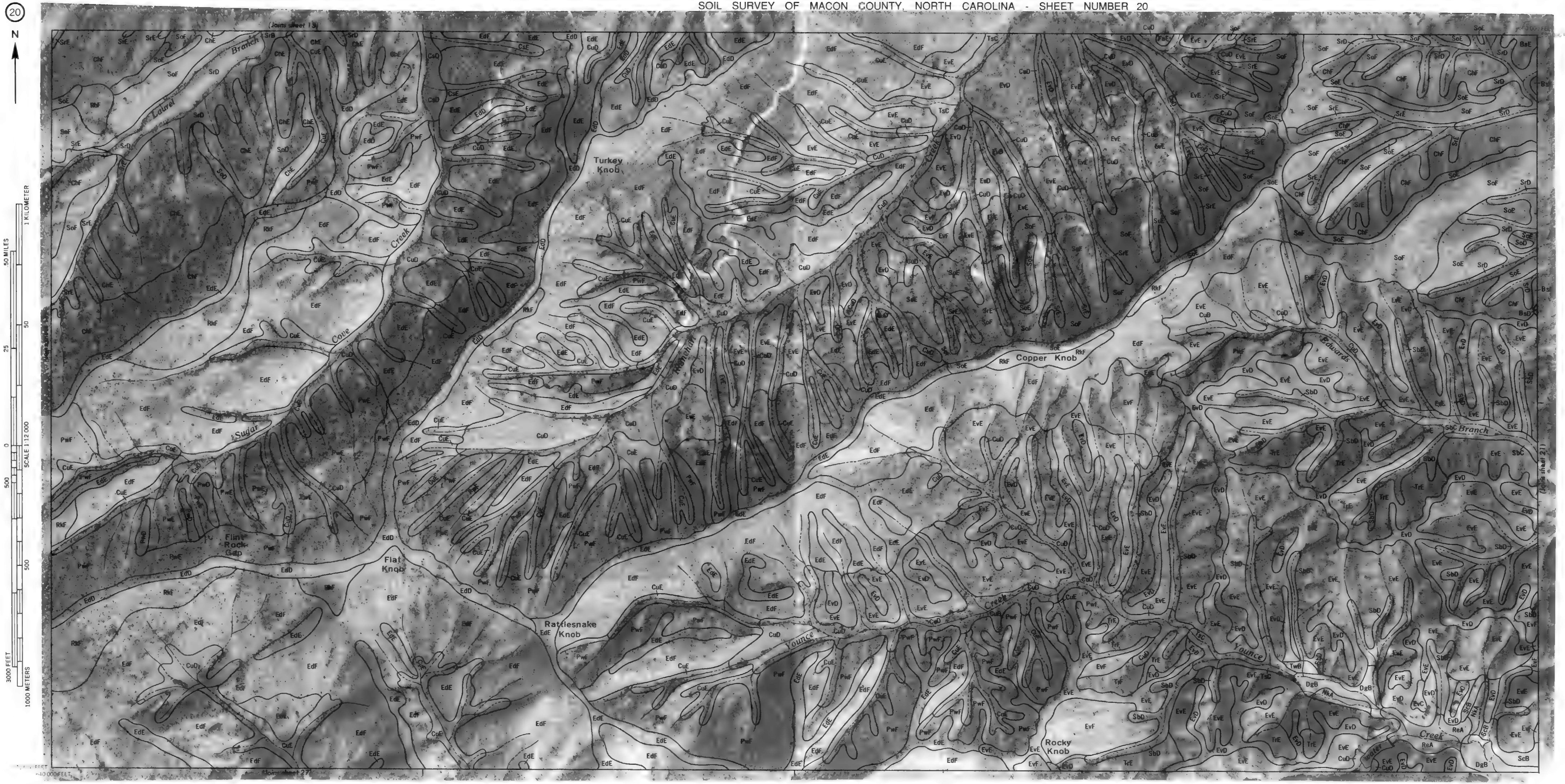

MACON COUNTY, NORTH CAROLINA NO. 20

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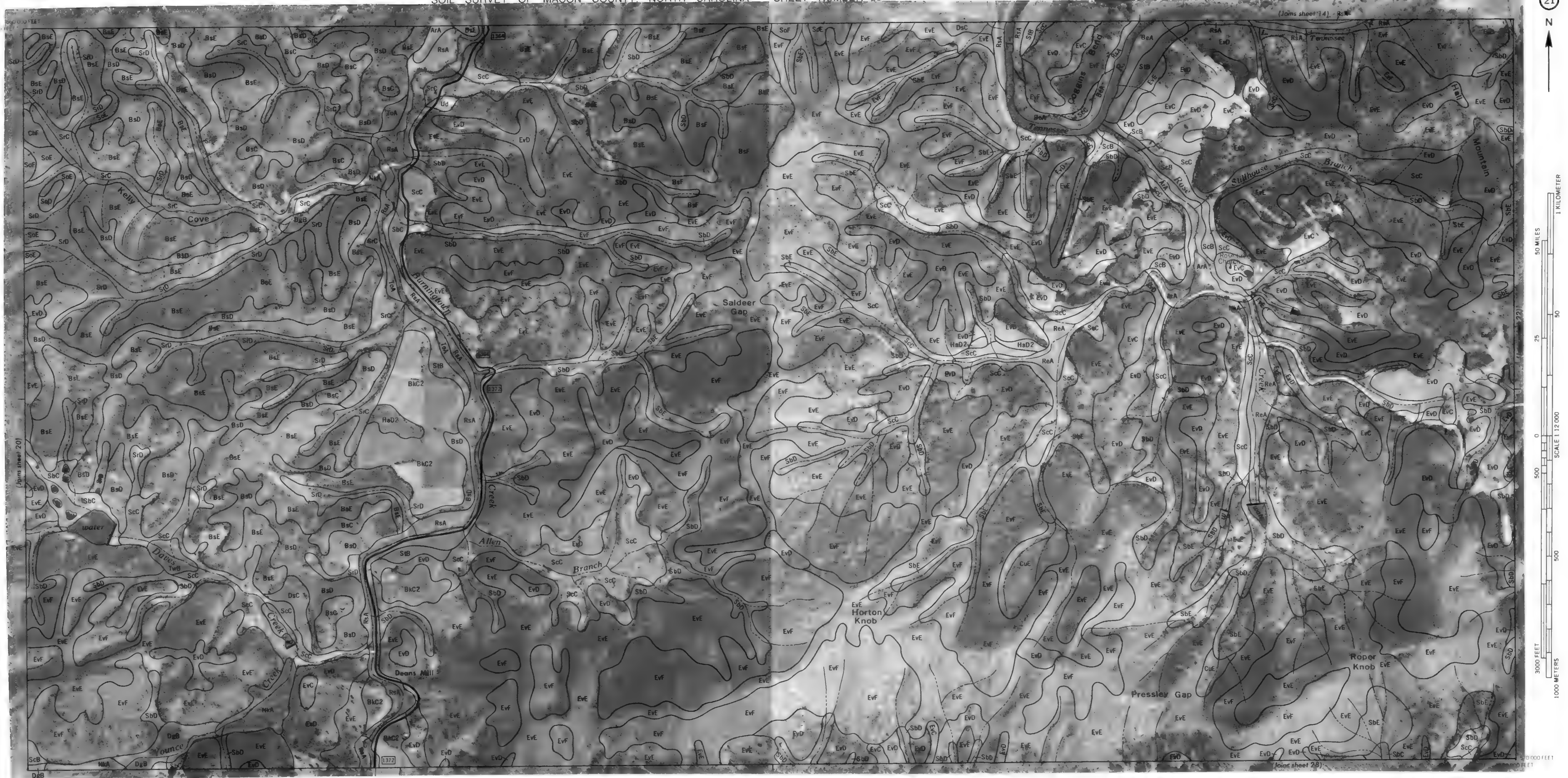

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MACON COUNTY, NORTH CAROLINA NO. 21

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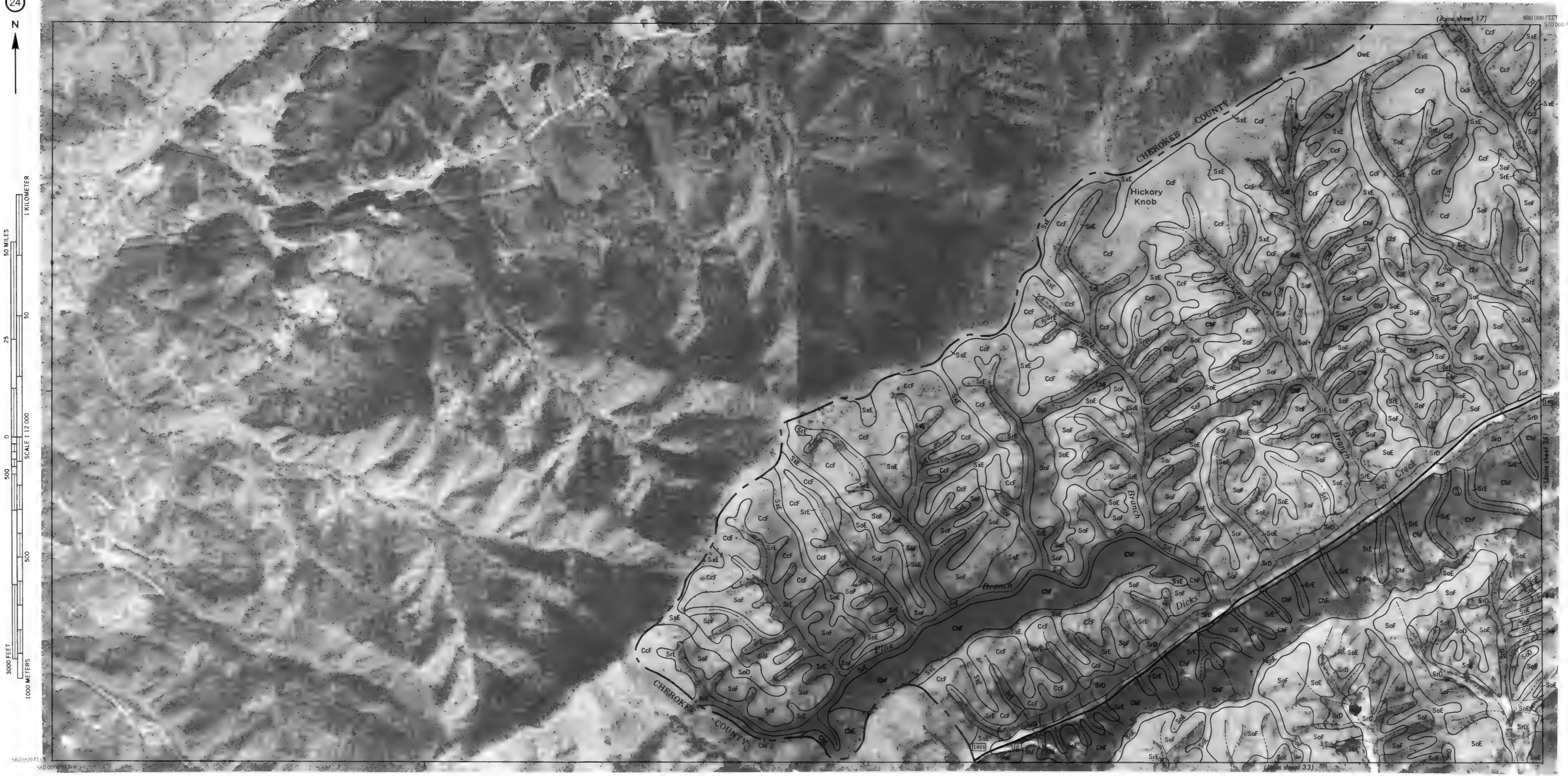

MACON COUNTY, NORTH CAROLINA NO. 24

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MACON COUNTY, NORTH CAROLINA NO. 25

SOIL SURVEY OF MACON COUNTY, NORTH CAROLINA - SHEET NUMBER 25

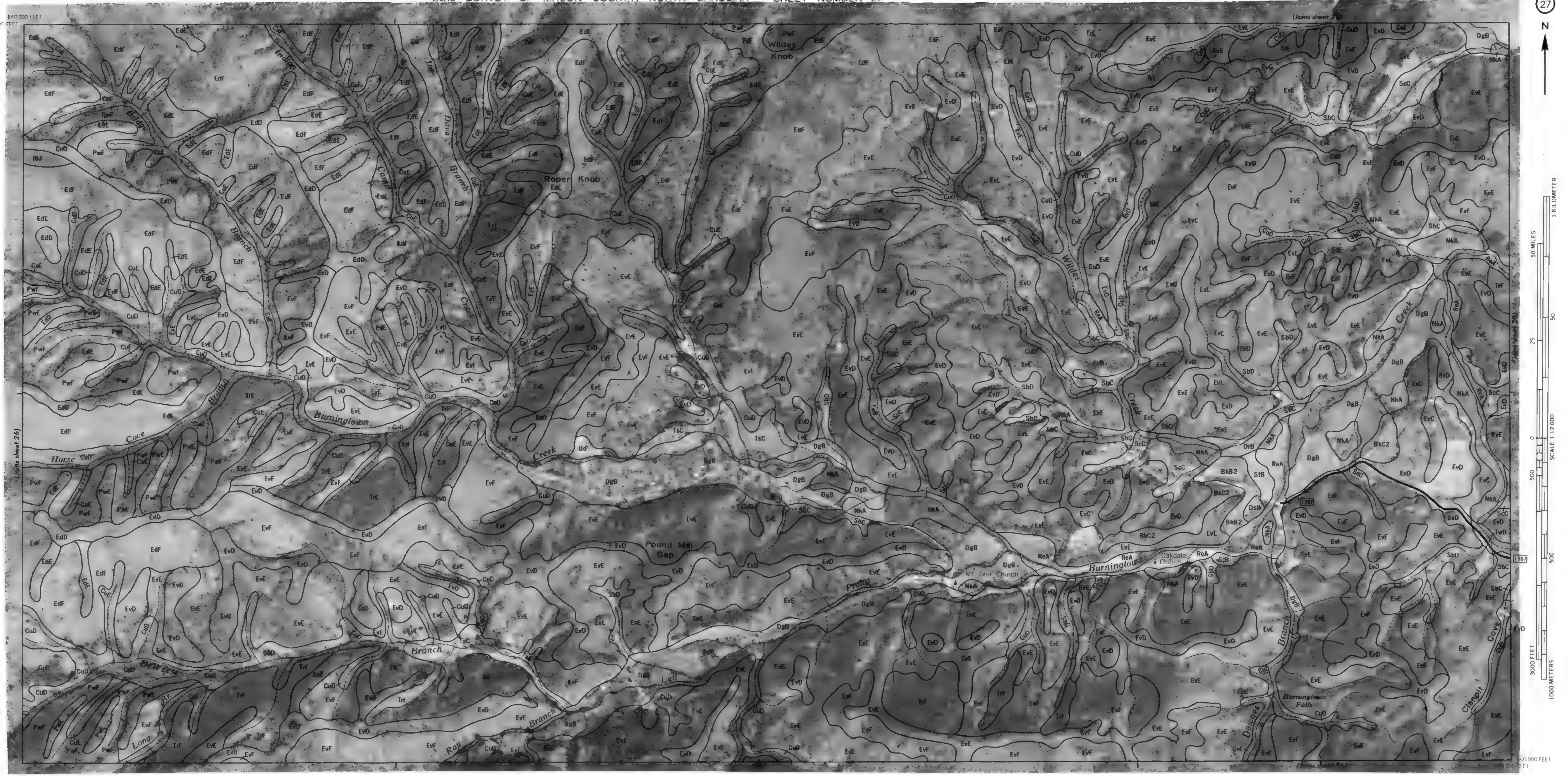
MACON COUNTY, NORTH CAROLINA NO. 26

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

27

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MACON COUNTY, NORTH CAROLINA NO. 27



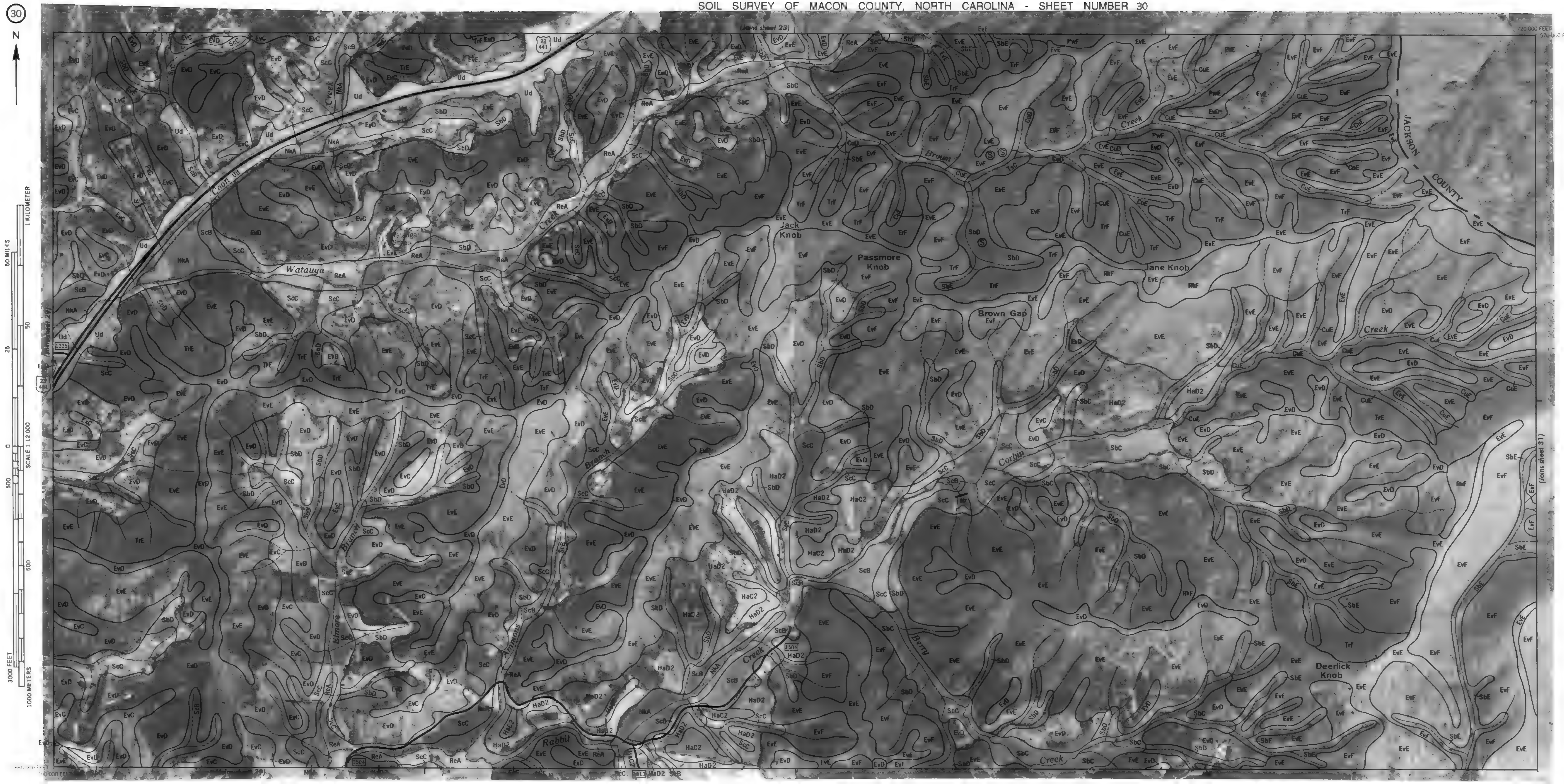
MACON COUNTY, NORTH CAROLINA NO. 28

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SOIL SURVEY OF MACON COUNTY, NORTH CAROLINA - SHEET NUMBER 29

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MACON COUNTY, NORTH CAROLINA NO. 29



MACON COUNTY, NORTH CAROLINA NO. 30

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

(31)

N

SCALE 1:12 000

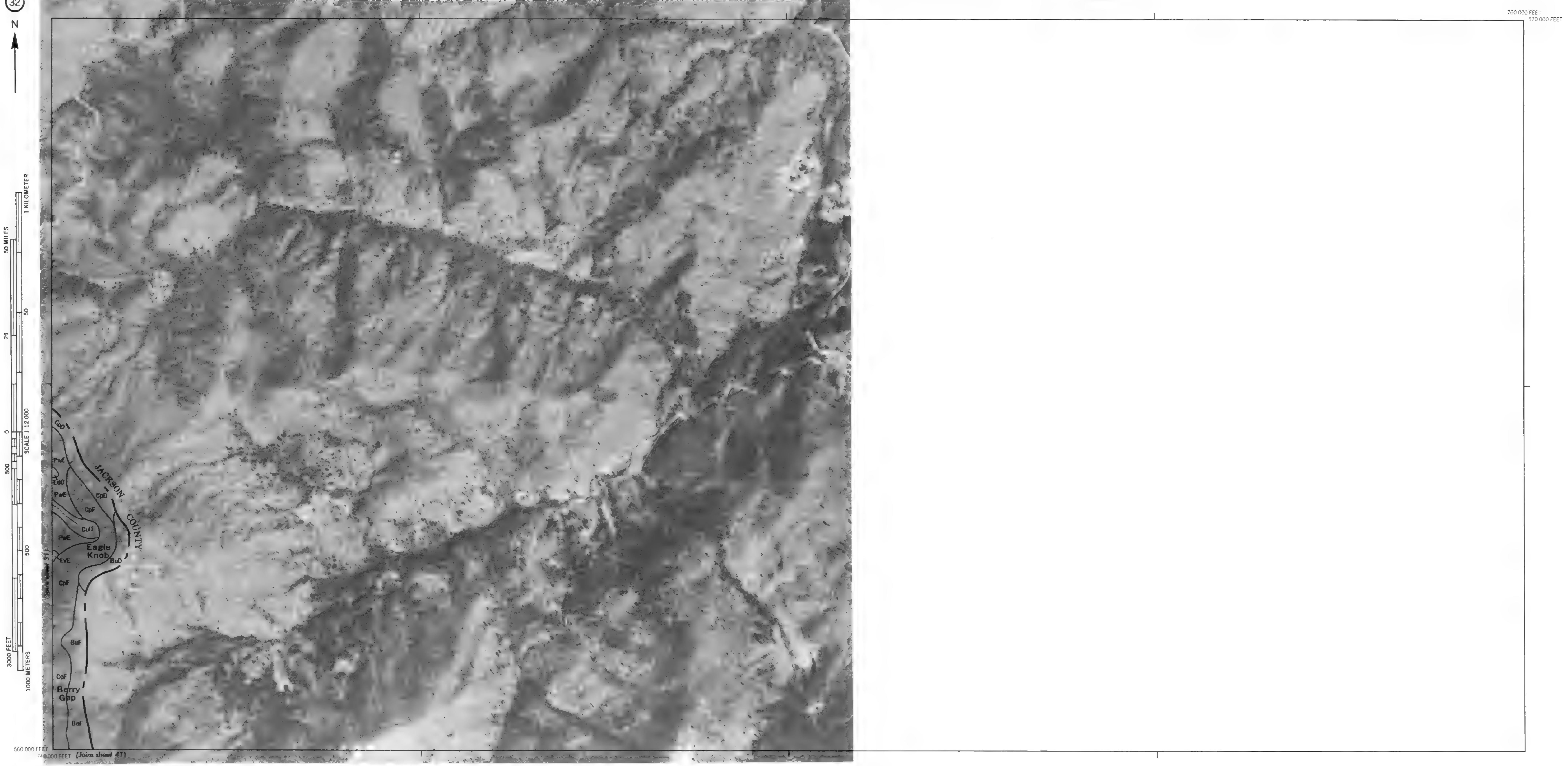
1 KILOMETER

3000 FEET

1000 METERS

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MACON COUNTY, NORTH CAROLINA NO. 31



MACON COUNTY, NORTH CAROLINA NO. 32

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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MACON COUNTY, NORTH CAROLINA NO. 33

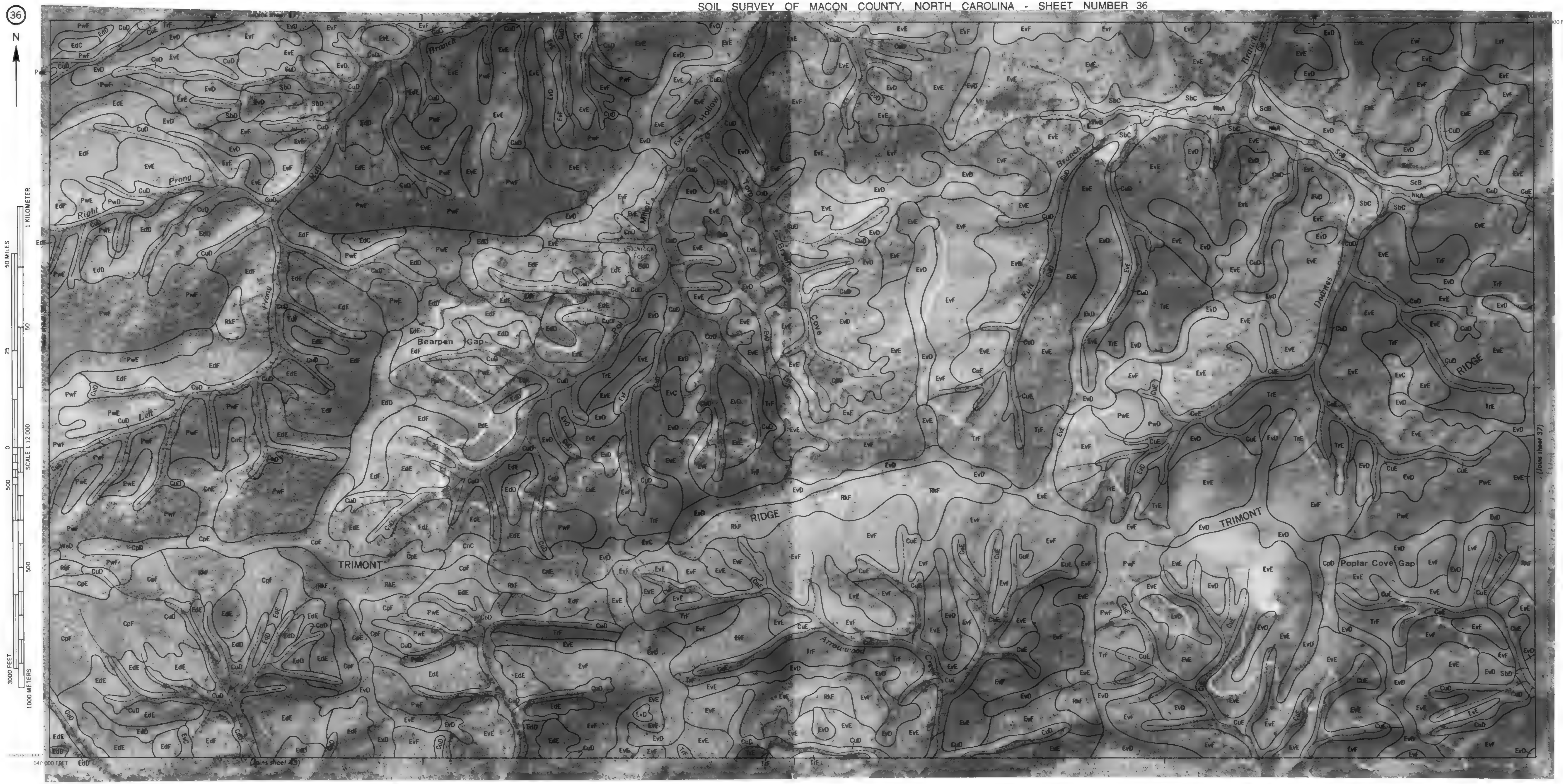
SOIL SURVEY OF MACON COUNTY, NORTH CAROLINA - SHEET NUMBER 34

MACON COUNTY, NORTH CAROLINA NO. 34

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

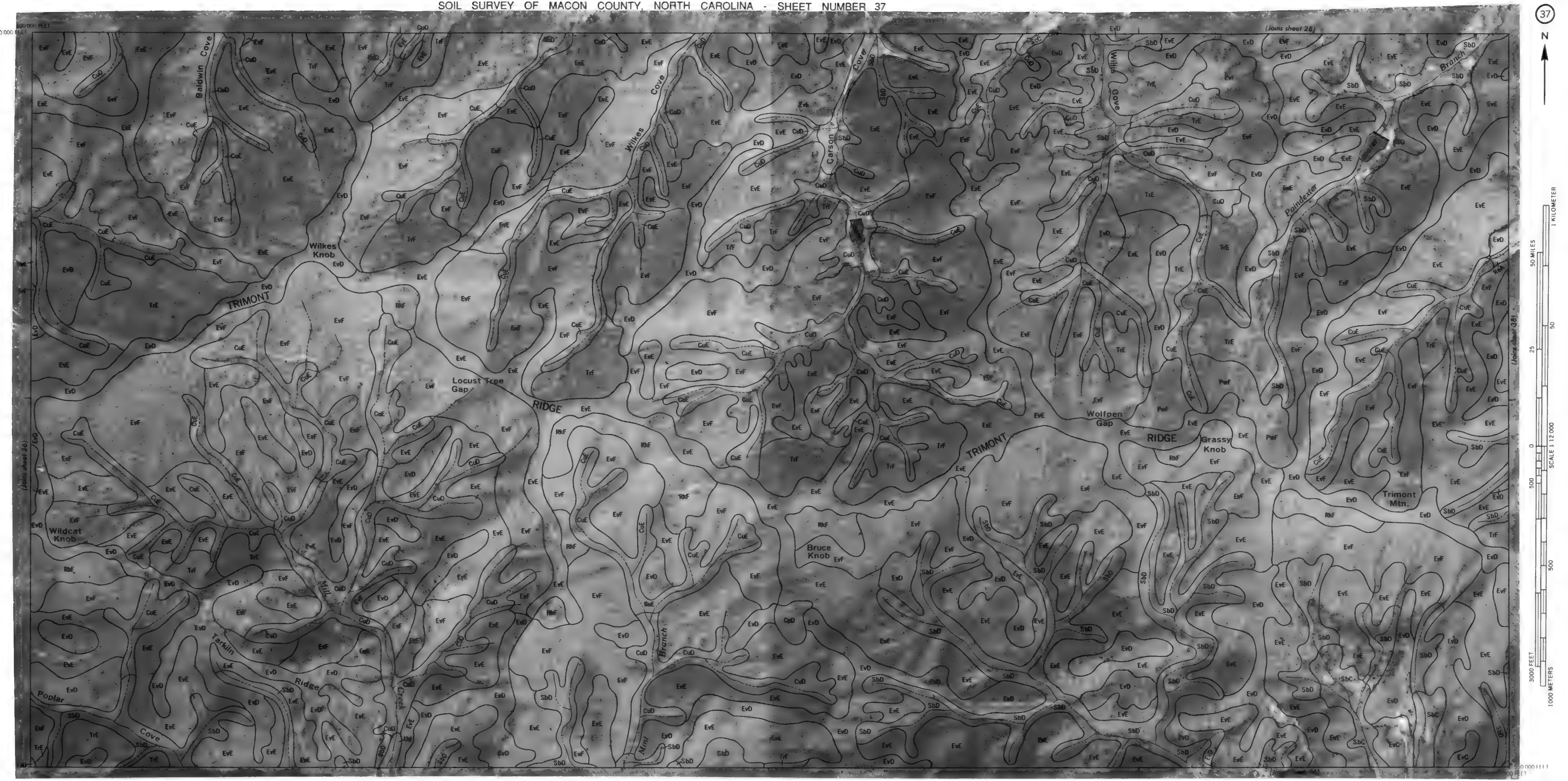
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MACON COUNTY, NORTH CAROLINA NO. 35



MACON COUNTY, NORTH CAROLINA NO. 36

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MACON COUNTY, NORTH CAROLINA NO. 37

SOIL SURVEY OF MACON COUNTY, NORTH CAROLINA - SHEET NUMBER 38

MACON COUNTY, NORTH CAROLINA NO. 38

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MACON COUNTY, NORTH CAROLINA NO. 39

39

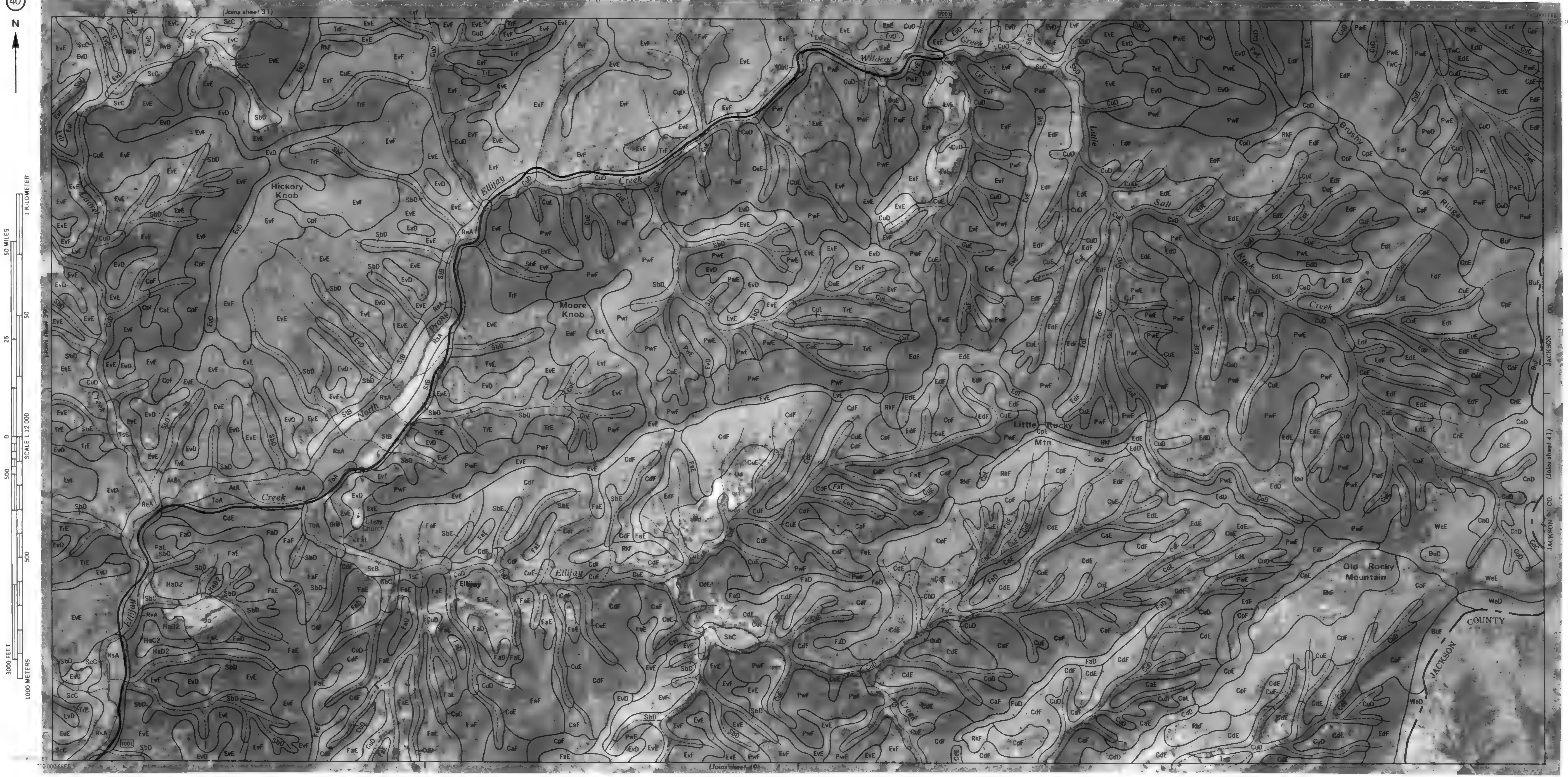
N

SCALE 1:12 000

1 KILOMETER

3000 FEET

1000 METERS

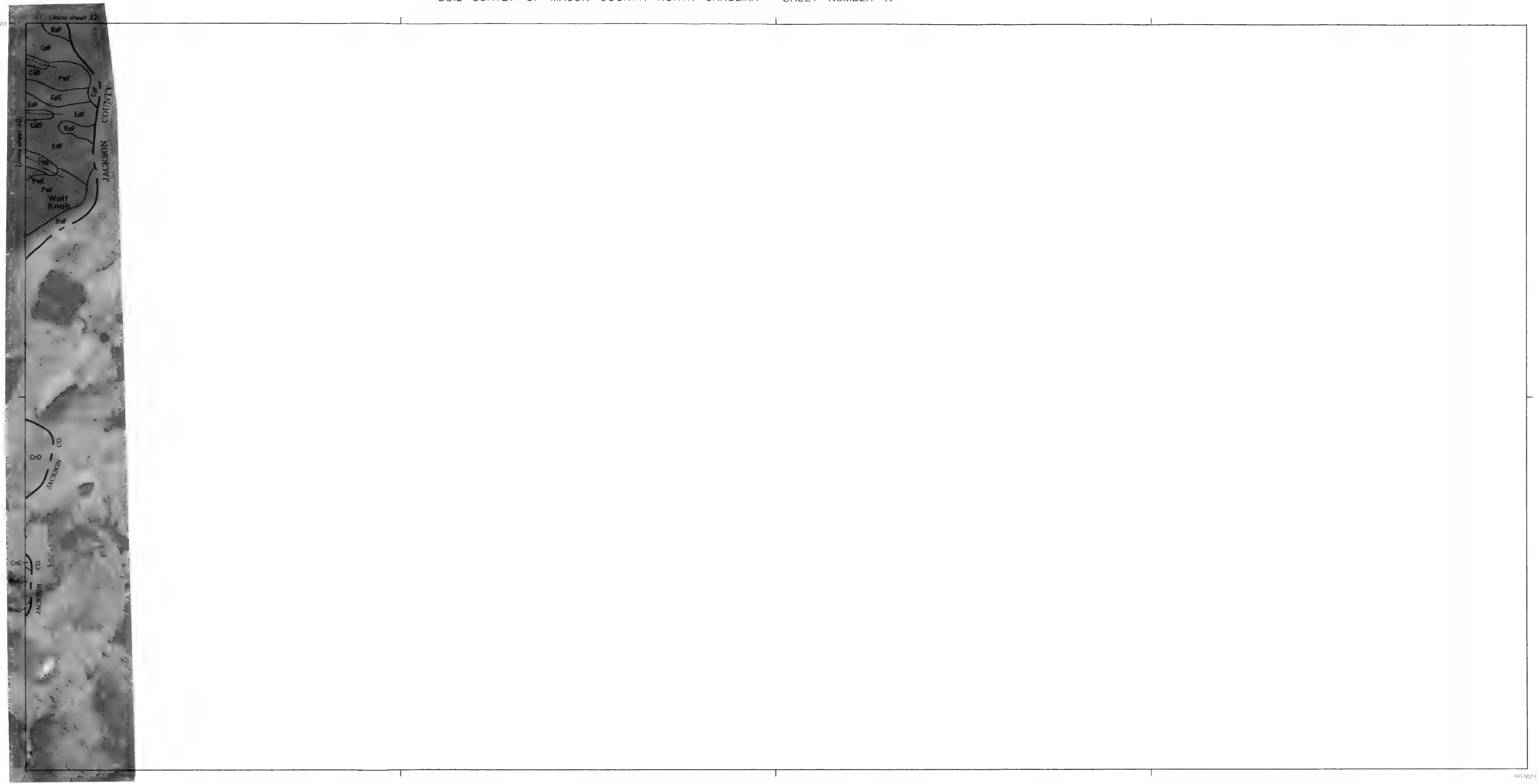


MACON COUNTY, NORTH CAROLINA NO. 40

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

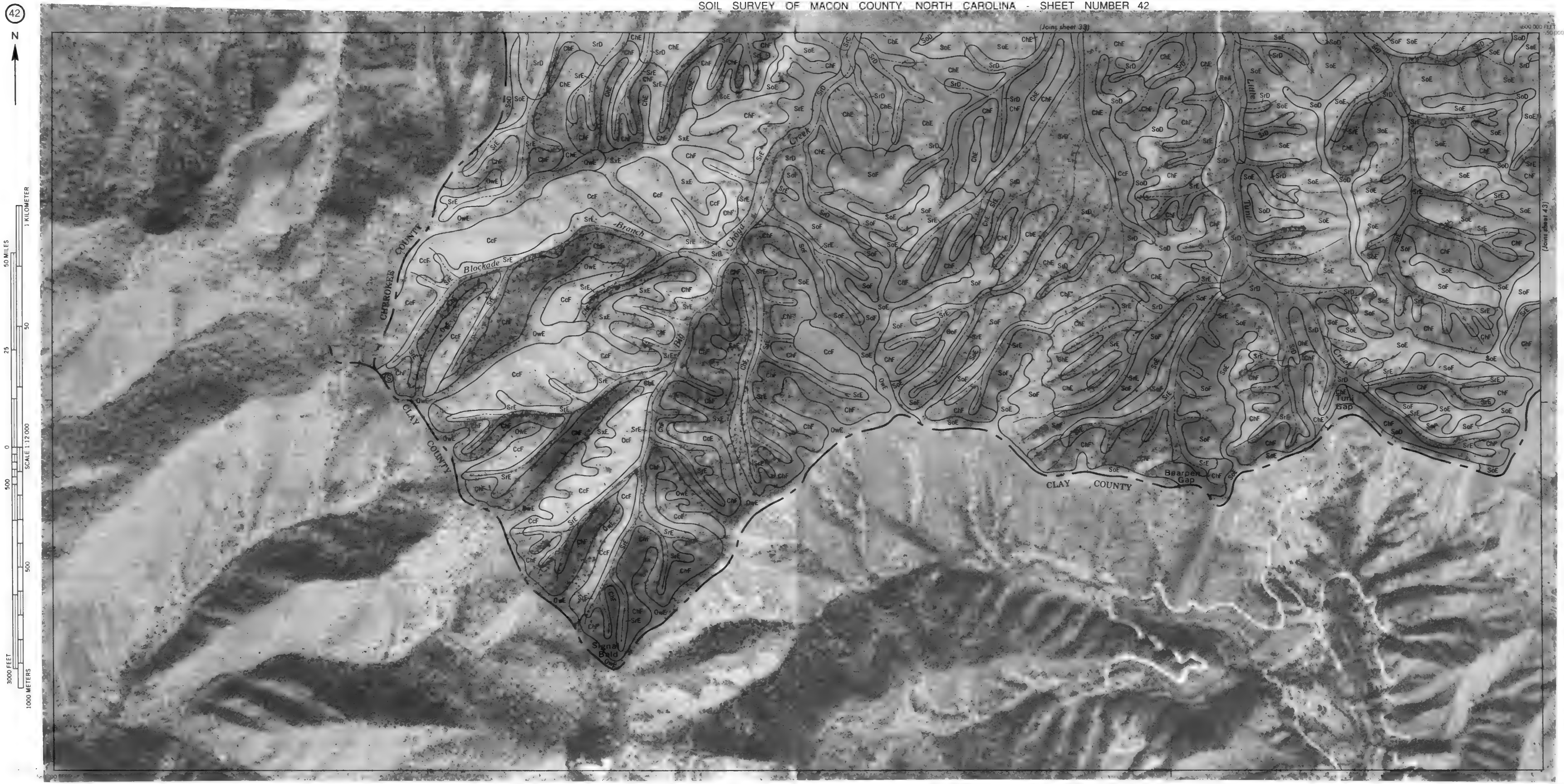
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MACON COUNTY, NORTH CAROLINA NO. 41



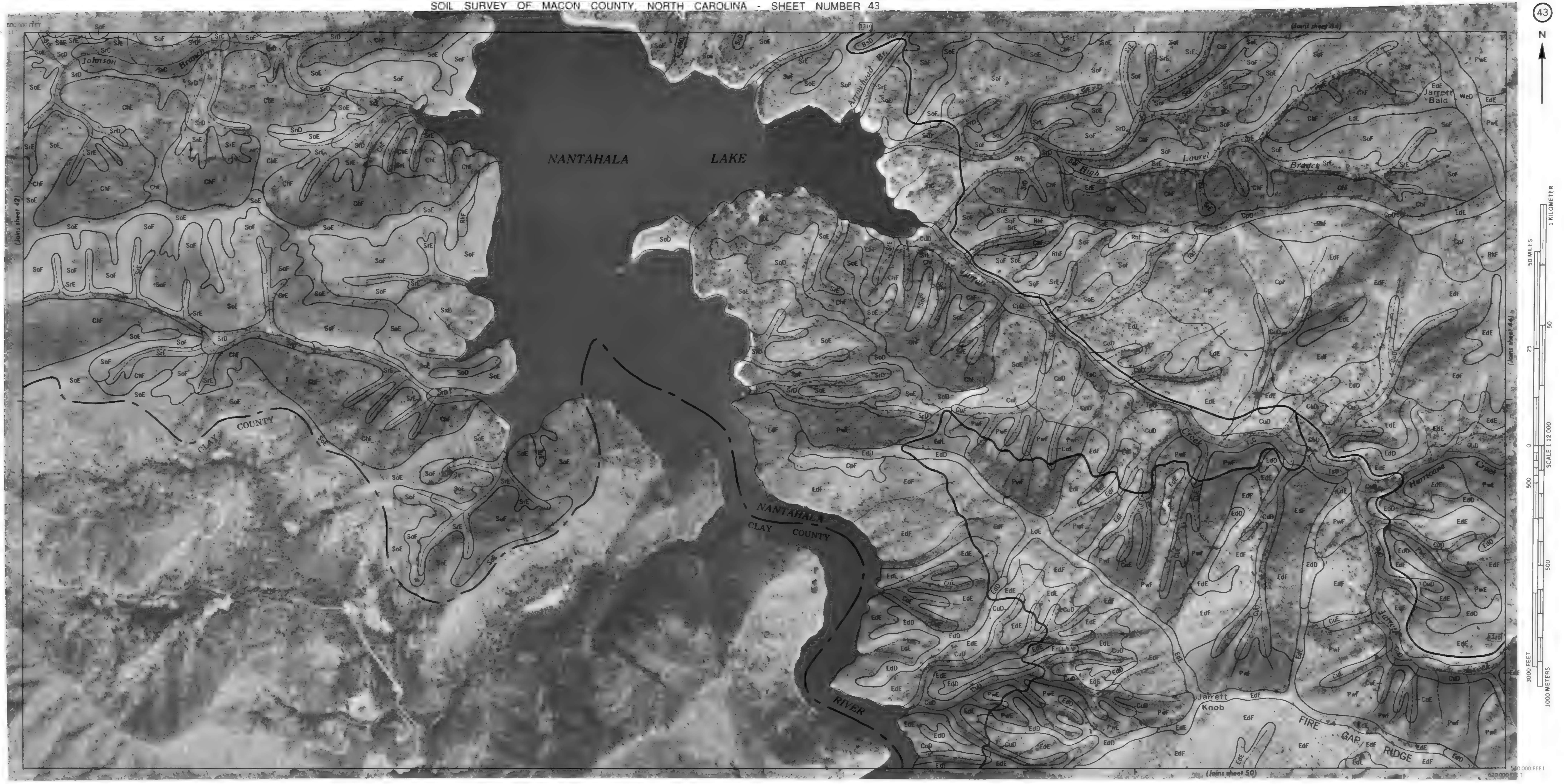
N

SCALE 1:12 000



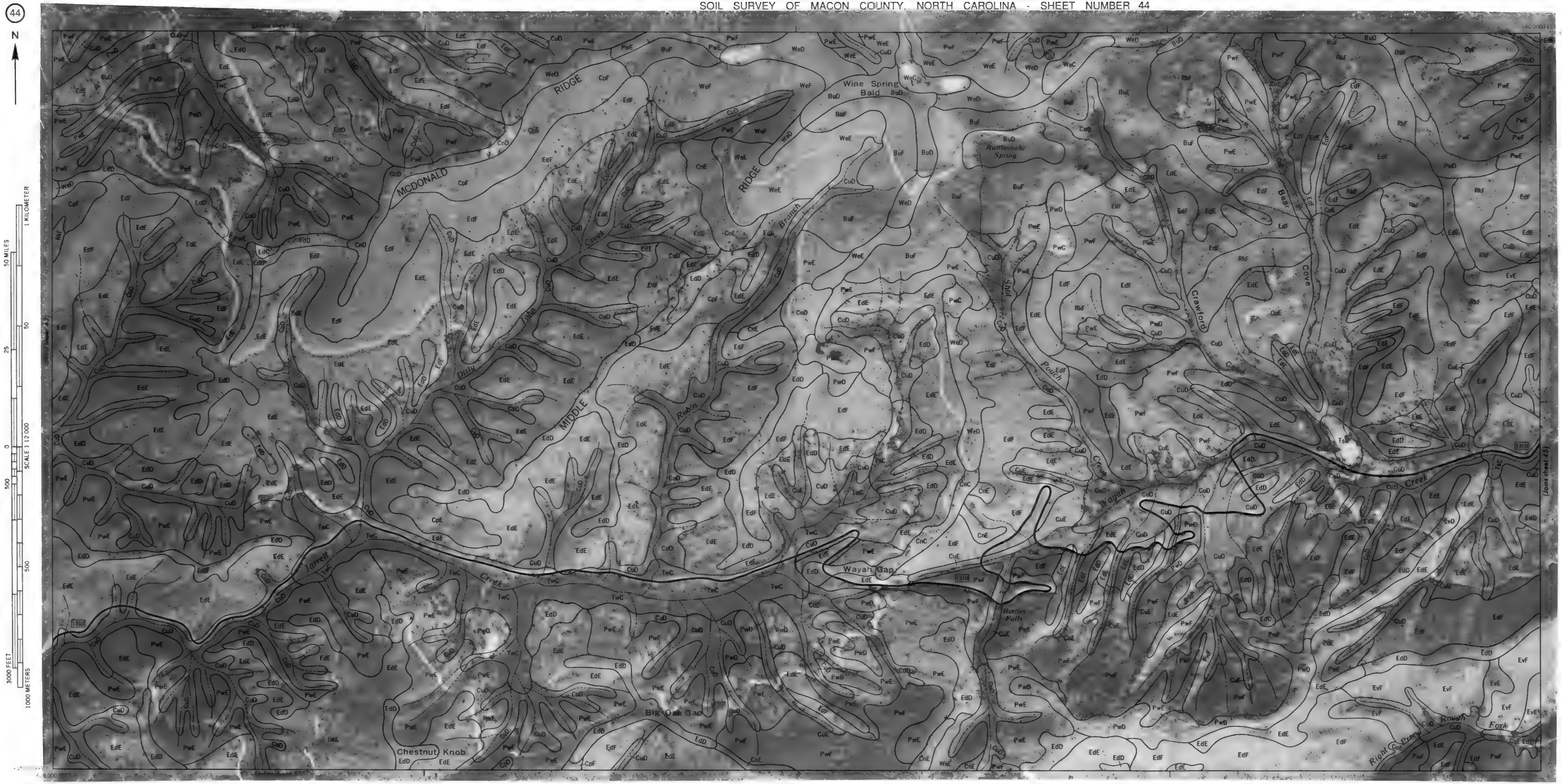
MACON COUNTY, NORTH CAROLINA NO. 42

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MACON COUNTY, NORTH CAROLINA NO. 43



MACON COUNTY, NORTH CAROLINA NO. 44

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Geological Survey from 1982 aerial photography.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MACON COUNTY, NORTH CAROLINA NO. 45

SCALE 1:12 000
1 KILOMETER
3000 FEET
1000 METERS

MACON COUNTY, NORTH CAROLINA NO. 46

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MACON COUNTY, NORTH CAROLINA NO. 47

47
N

1 KILOMETER
SCALE 1:12 000
3000 FEET
1000 METERS

MACON COUNTY, NORTH CAROLINA NO. 48

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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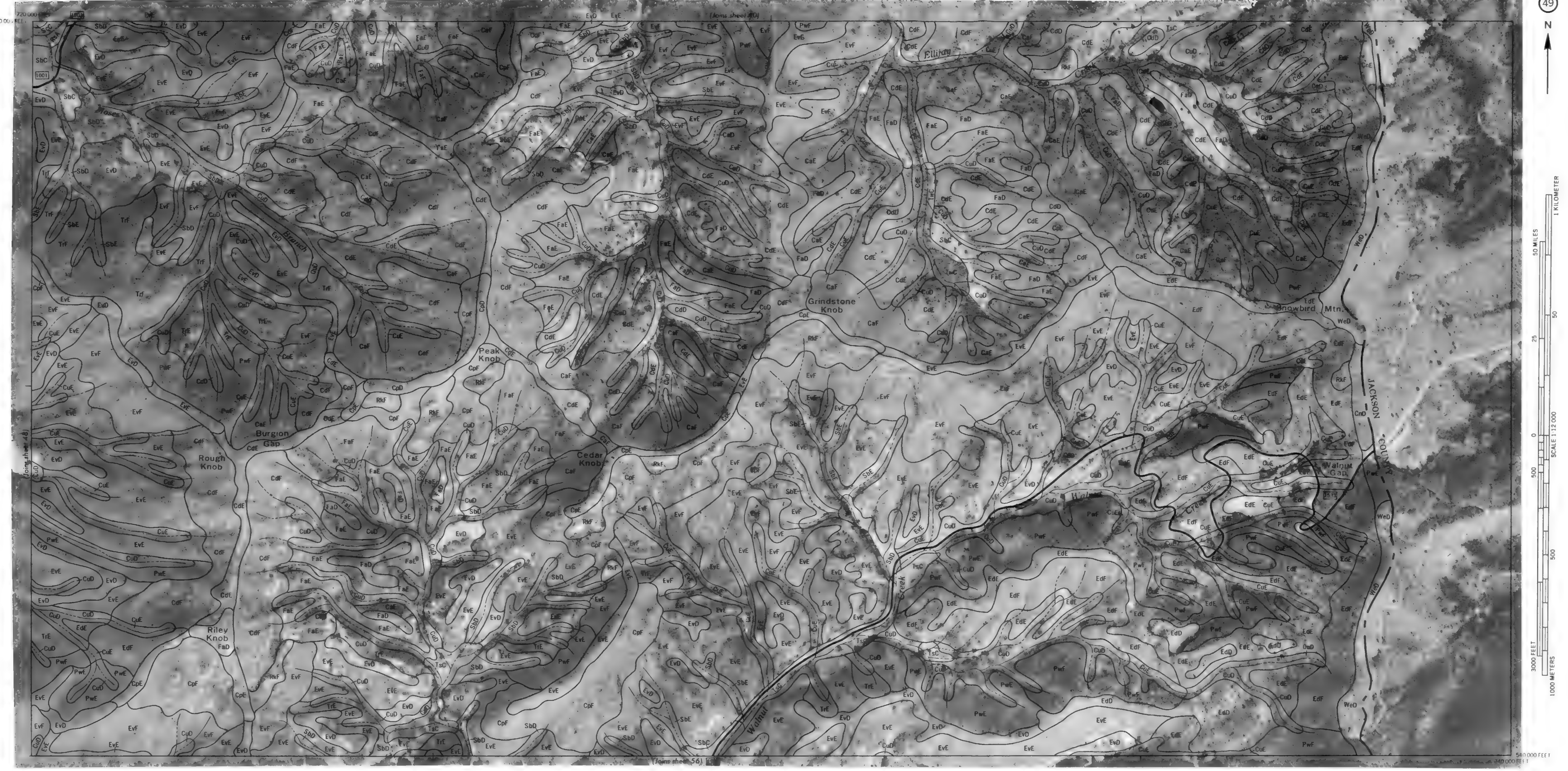
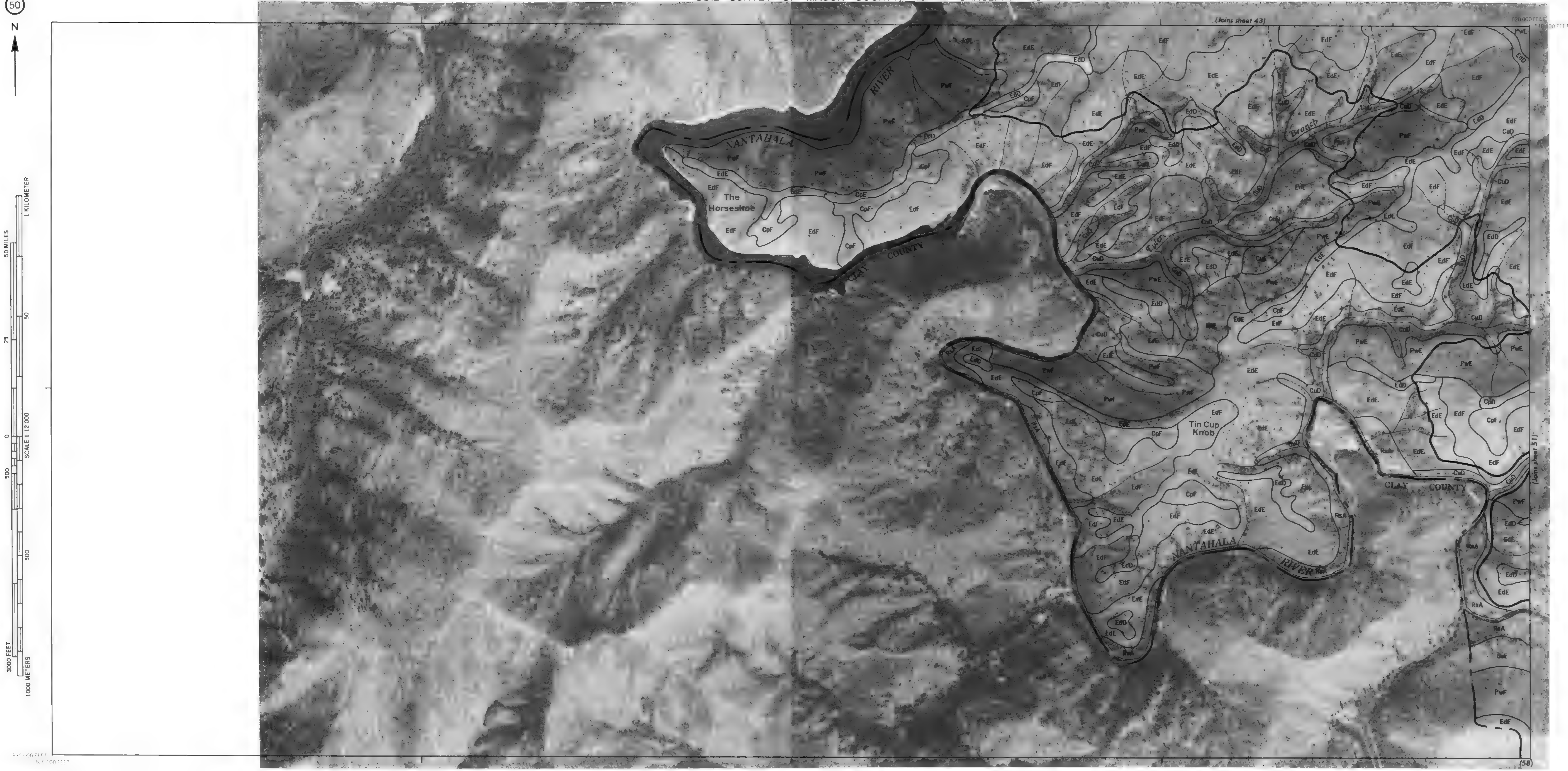
MACON COUNTY, NORTH CAROLINA NO. 49





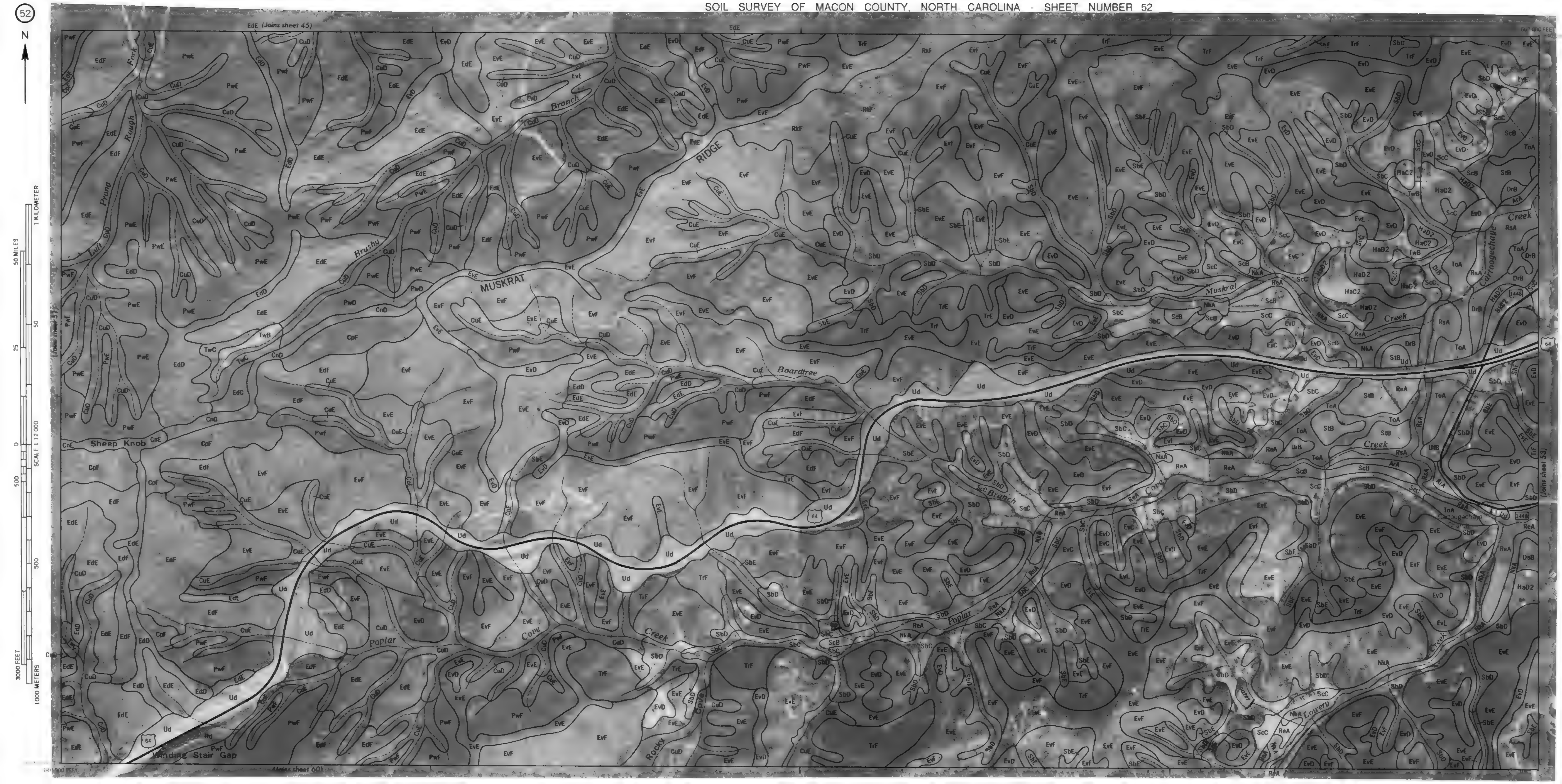
MACON COUNTY, NORTH CAROLINA NO. 50

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SOIL SURVEY OF MACON COUNTY, NORTH CAROLINA - SHEET NUMBER 51

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MACON COUNTY, NORTH CAROLINA NO. 51



MACON COUNTY, NORTH CAROLINA NO. 52

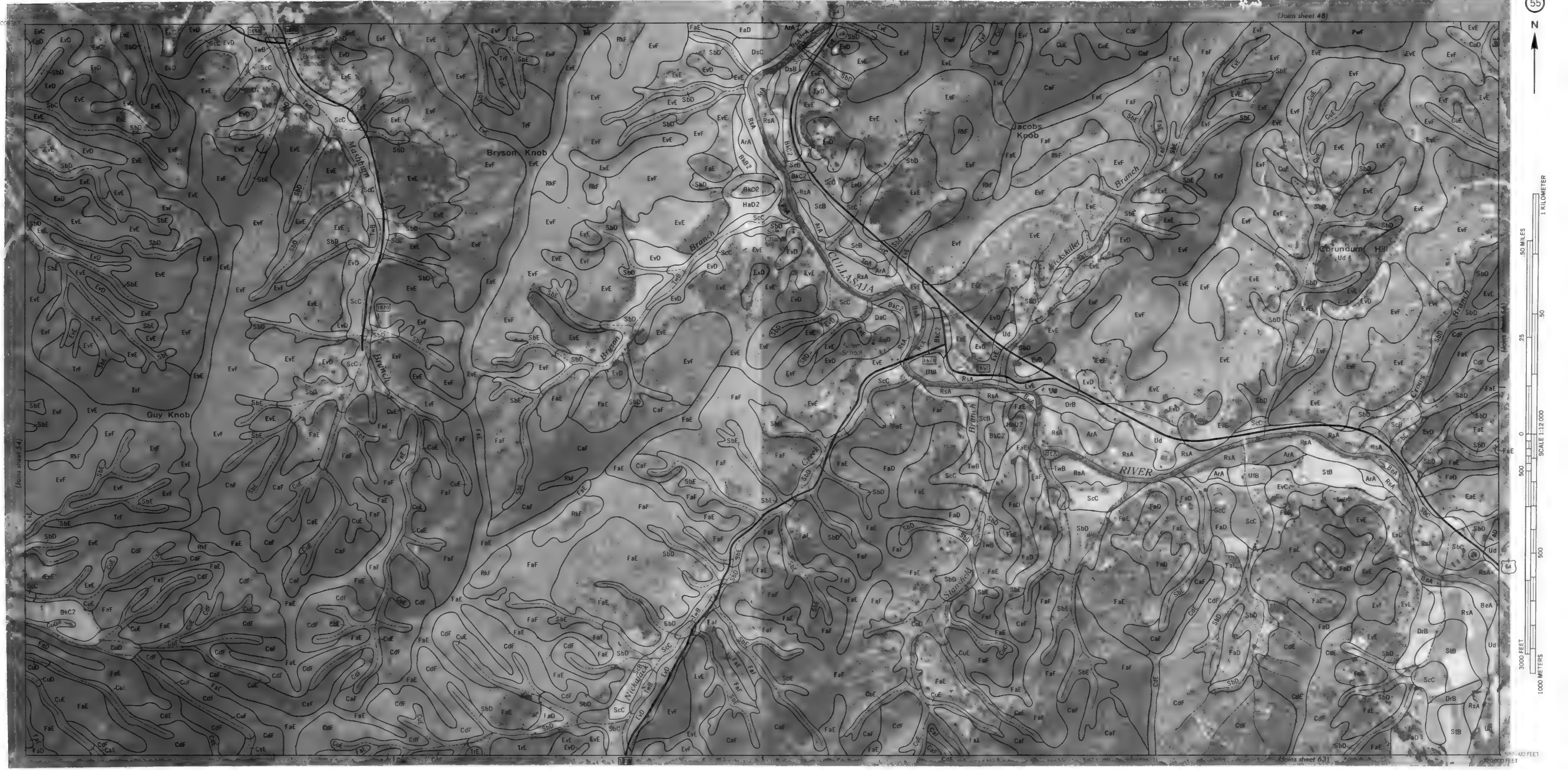
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MACON COUNTY, NORTH CAROLINA NO. 53

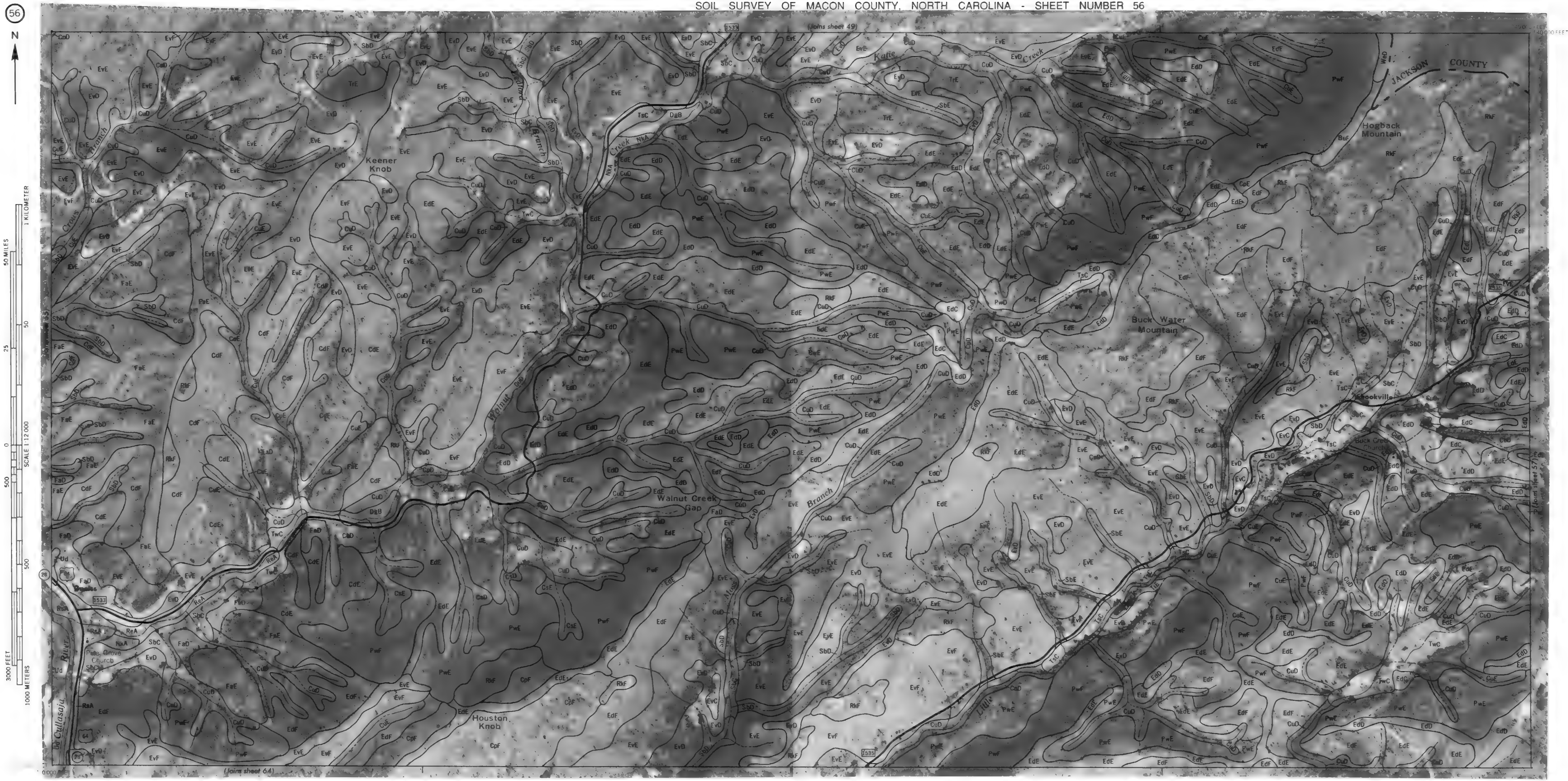
MACON COUNTY, NORTH CAROLINA NO. 54

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MACON COUNTY, NORTH CAROLINA NO. 55



MACON COUNTY, NORTH CAROLINA NO. 56

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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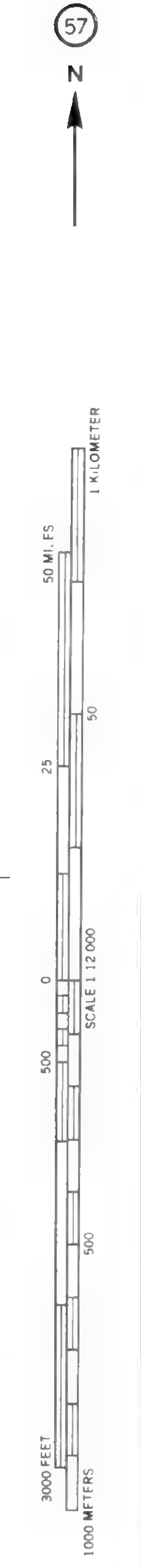
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MACON COUNTY, NORTH CAROLINA NO. 57



(58)

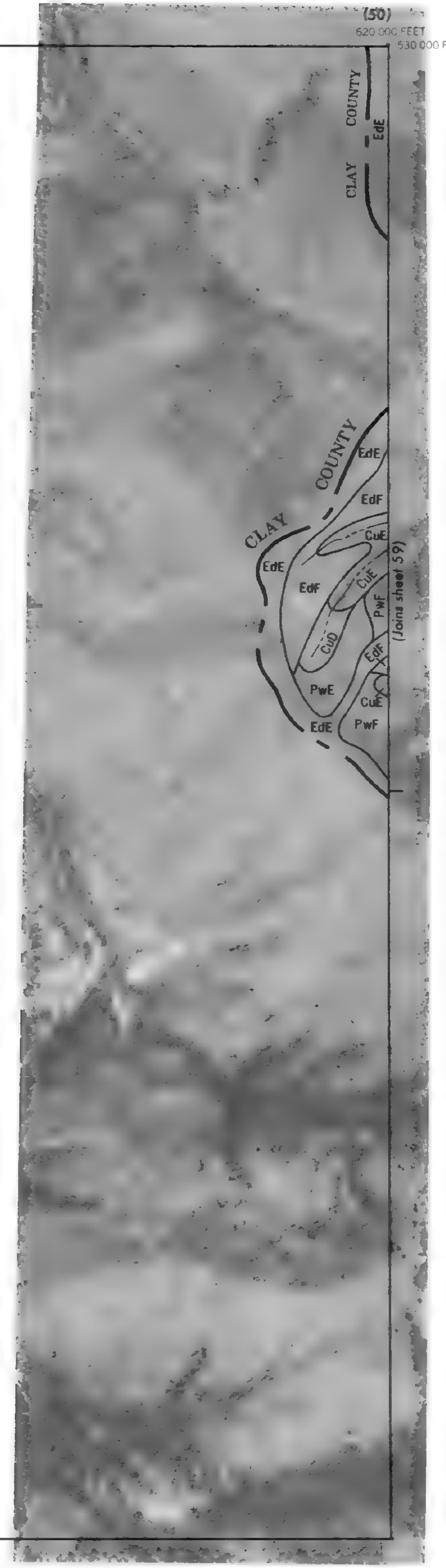
N

SCALE 1:12 000

1 KILOMETER

3000 FEET

1000 METERS

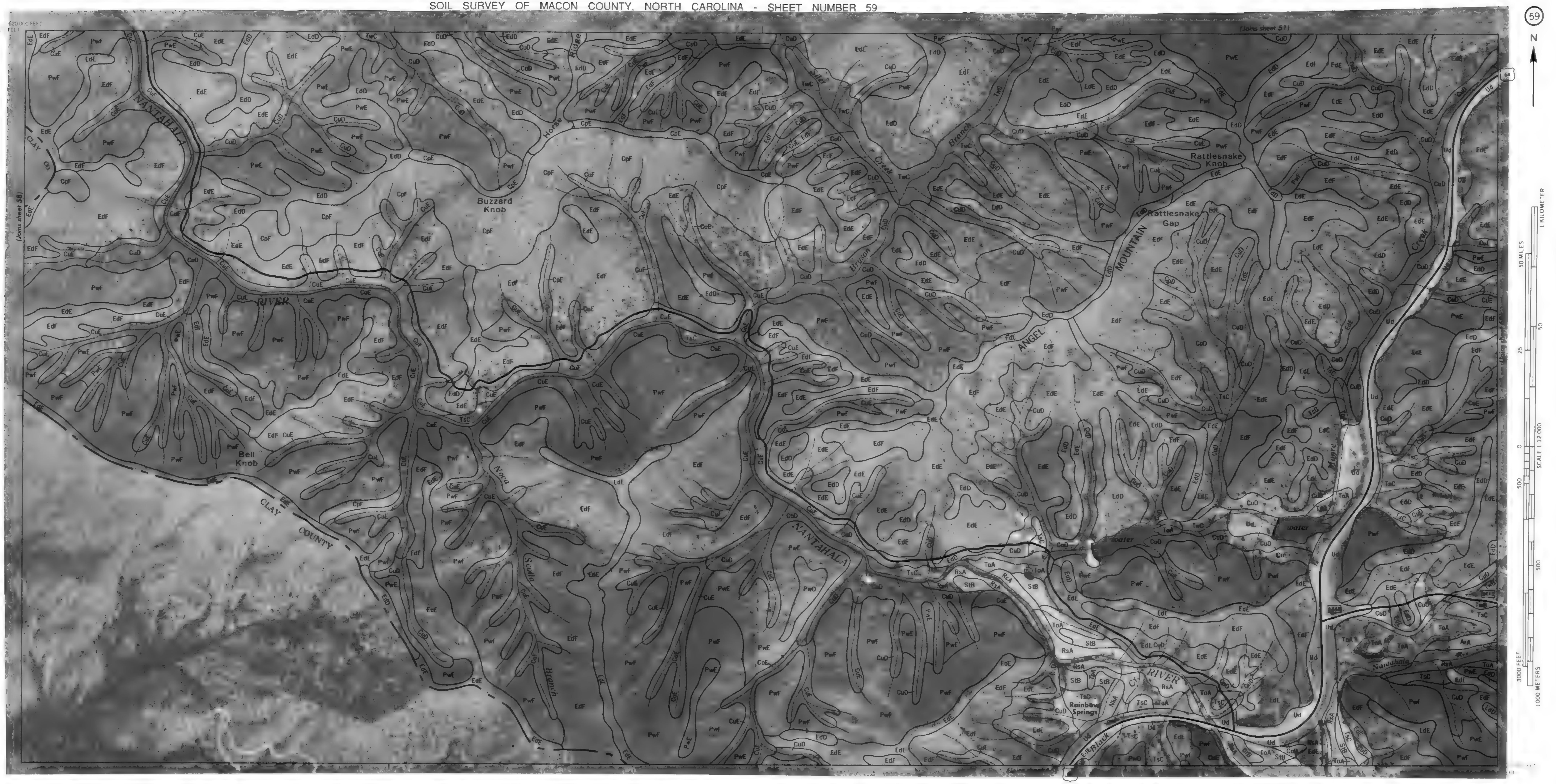


520 000 FEET

600 000 FEET

MACON COUNTY, NORTH CAROLINA NO. 58

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

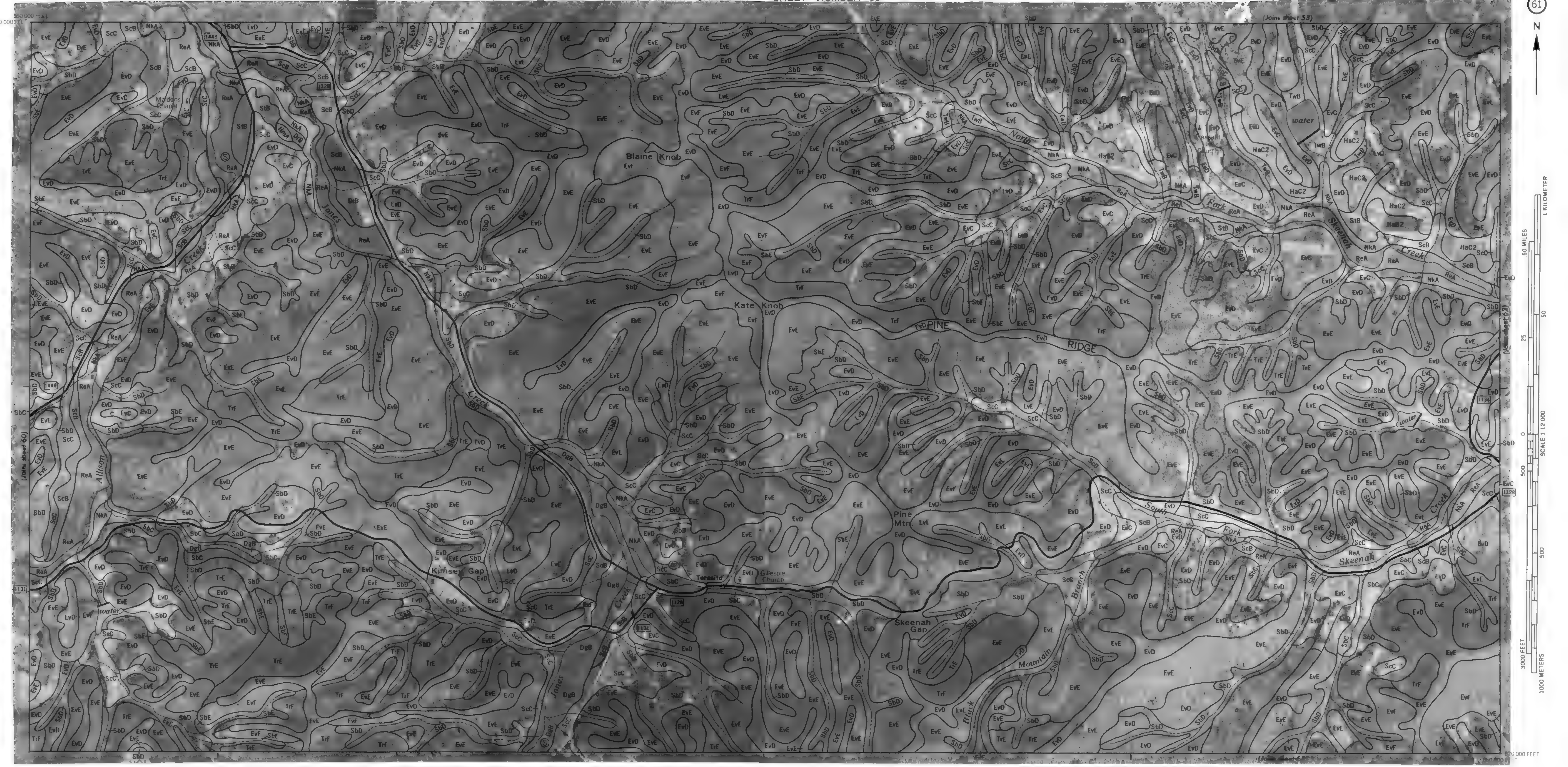
MACON COUNTY, NORTH CAROLINA NO. 59

MACON COUNTY, NORTH CAROLINA NO. 60

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MACON COUNTY, NORTH CAROLINA NO. 61



62

N

1 KILOMETER

SCALE 1:12 000

3000 FEET

1000 METERS

MACON COUNTY, NORTH CAROLINA NO. 62

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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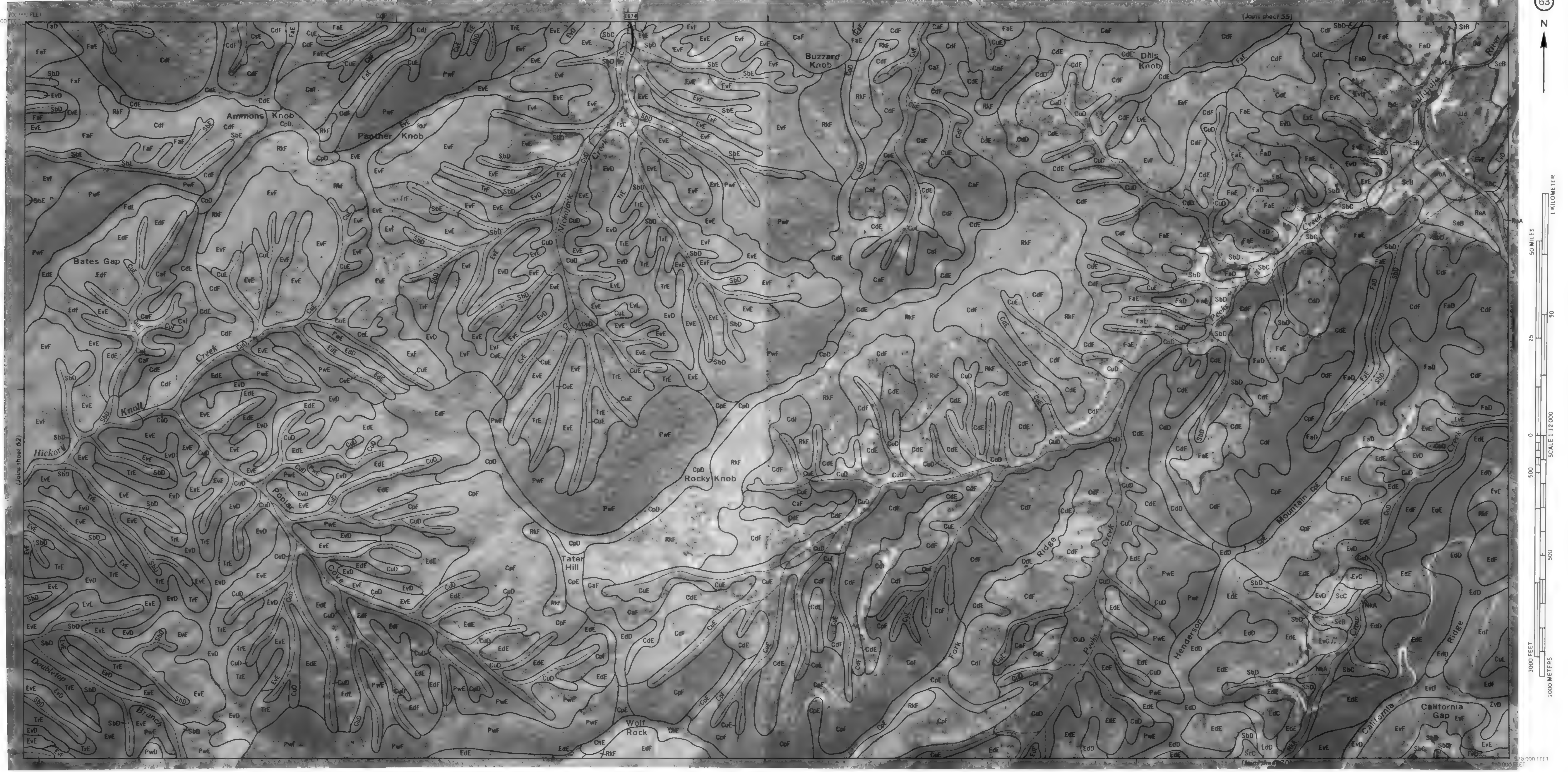
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MACON COUNTY, NORTH CAROLINA NO. 63



SOIL SURVEY OF MACON COUNTY, NORTH CAROLINA - SHEET NUMBER 64

64

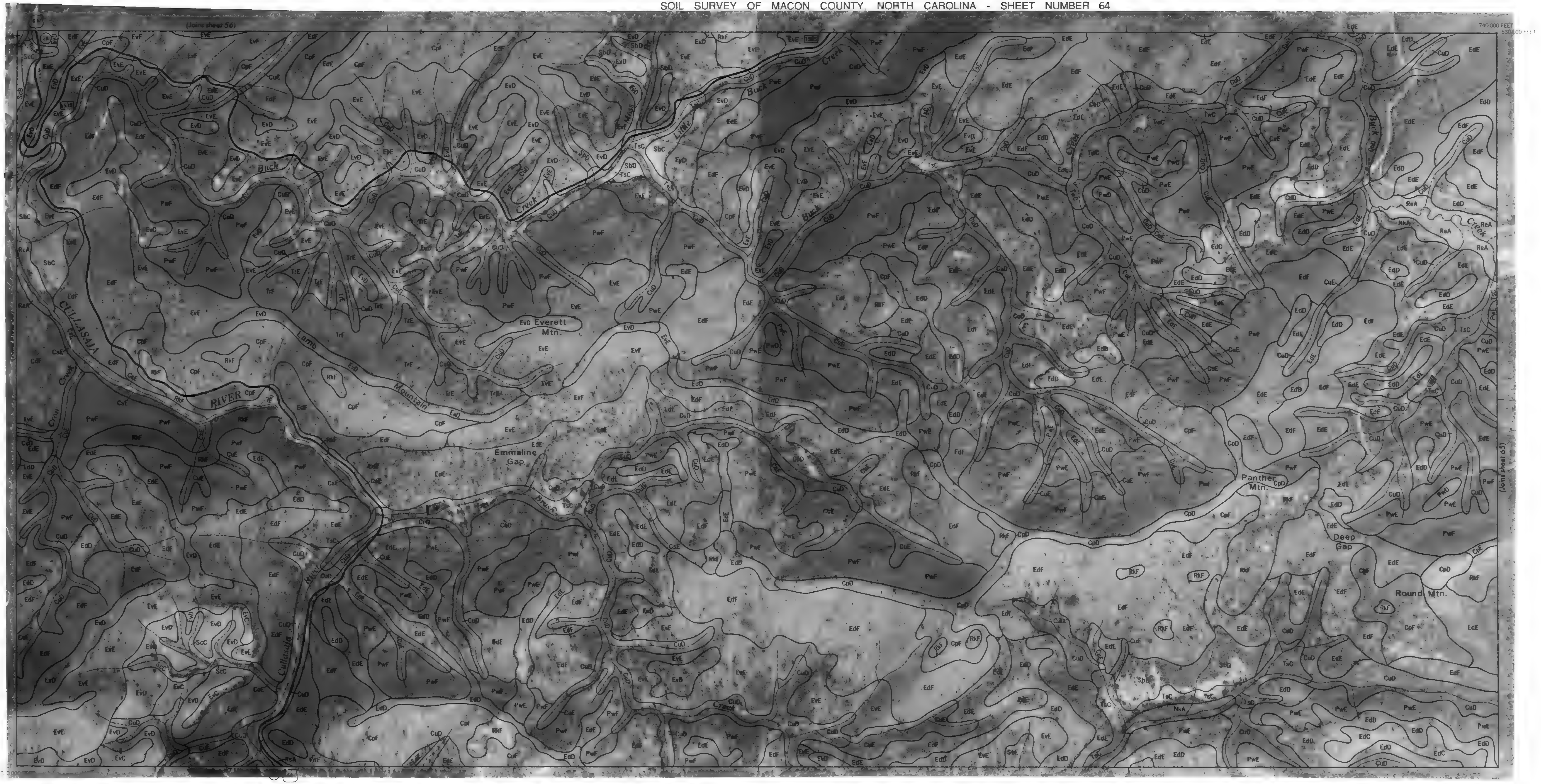
N

SCALE 1:12 000

1 KILOMETER

3000 FEET

1000 METERS

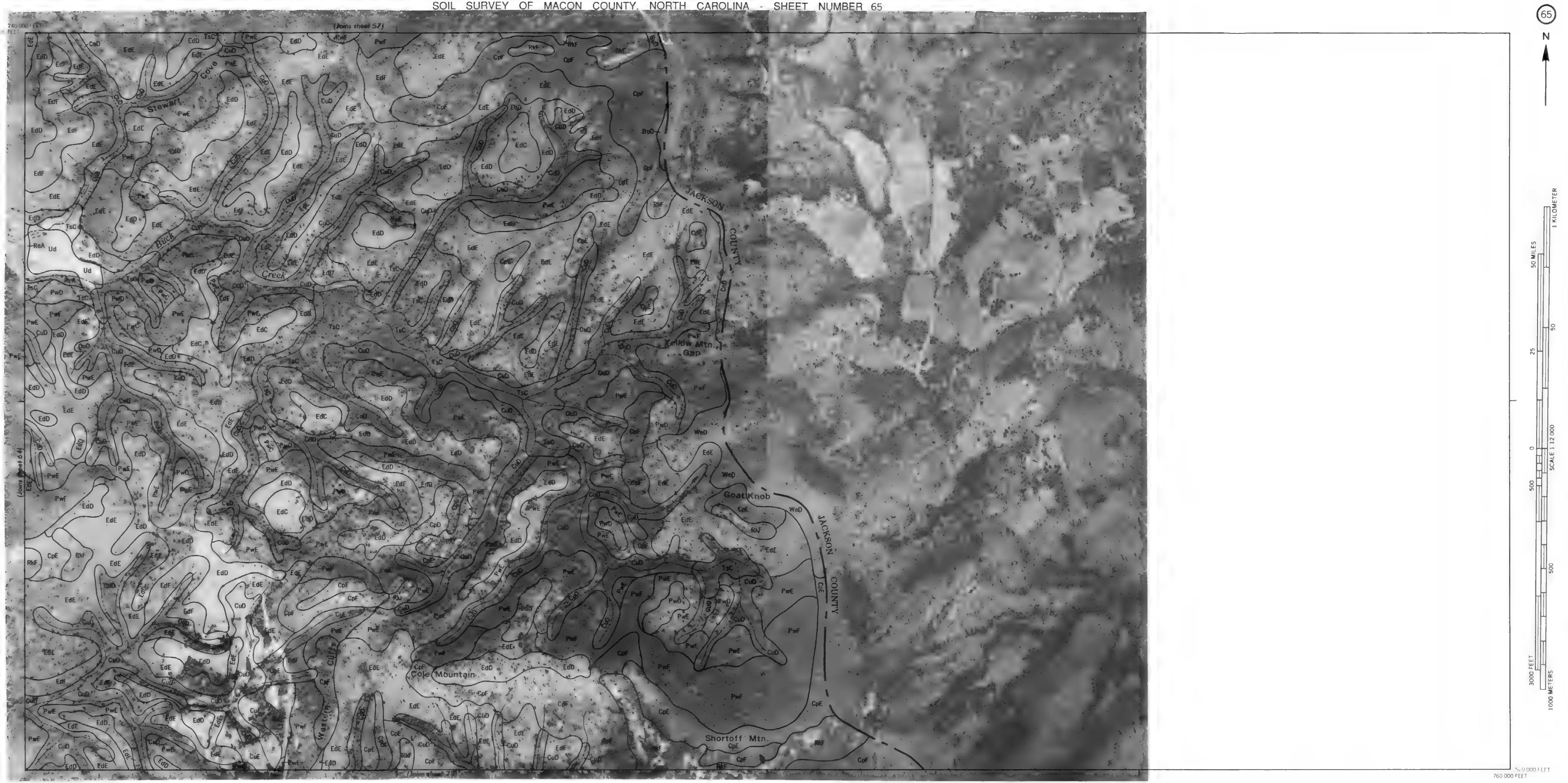


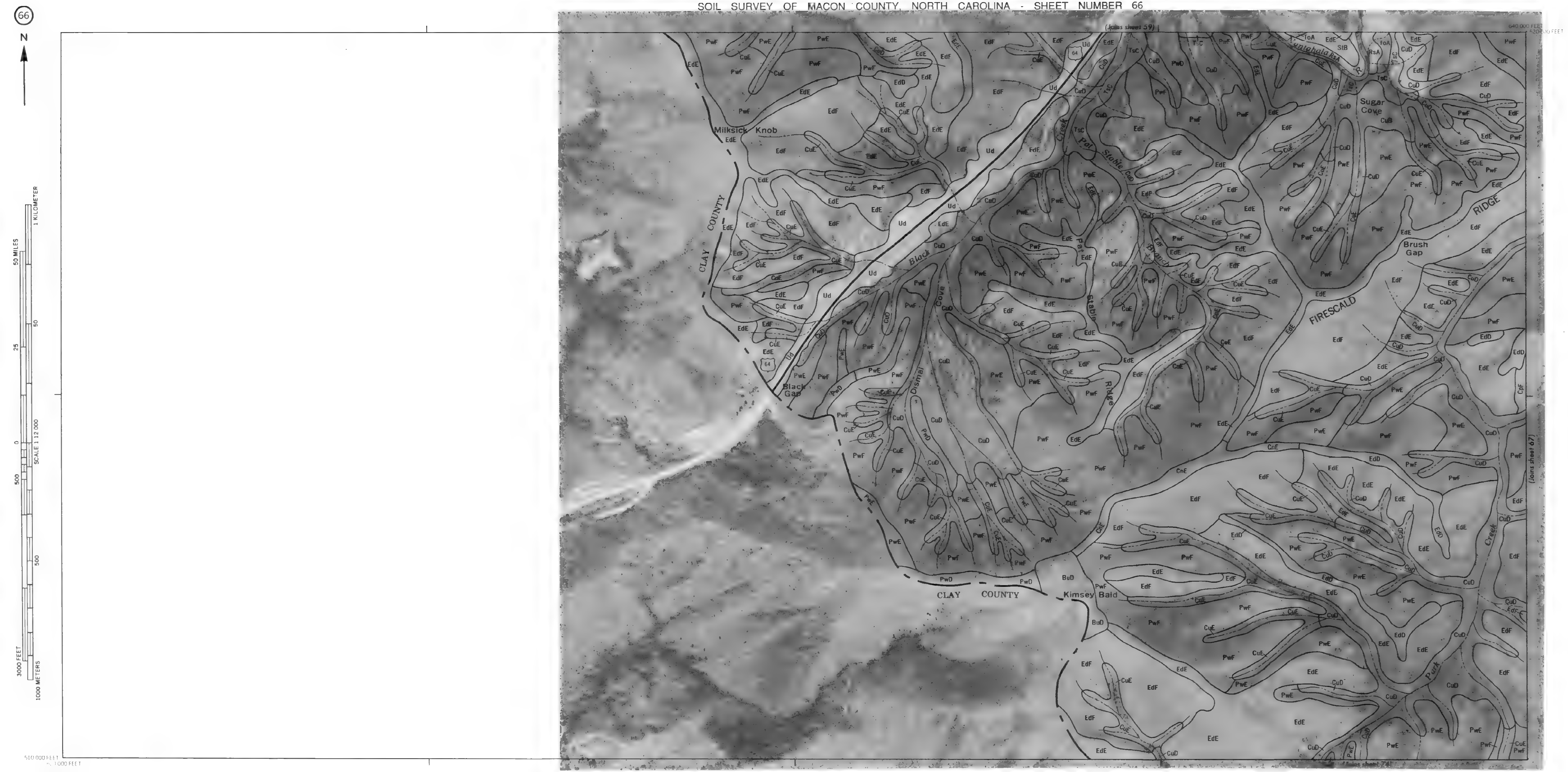
MACON COUNTY, NORTH CAROLINA NO. 64

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MACON COUNTY, NORTH CAROLINA NO. 65

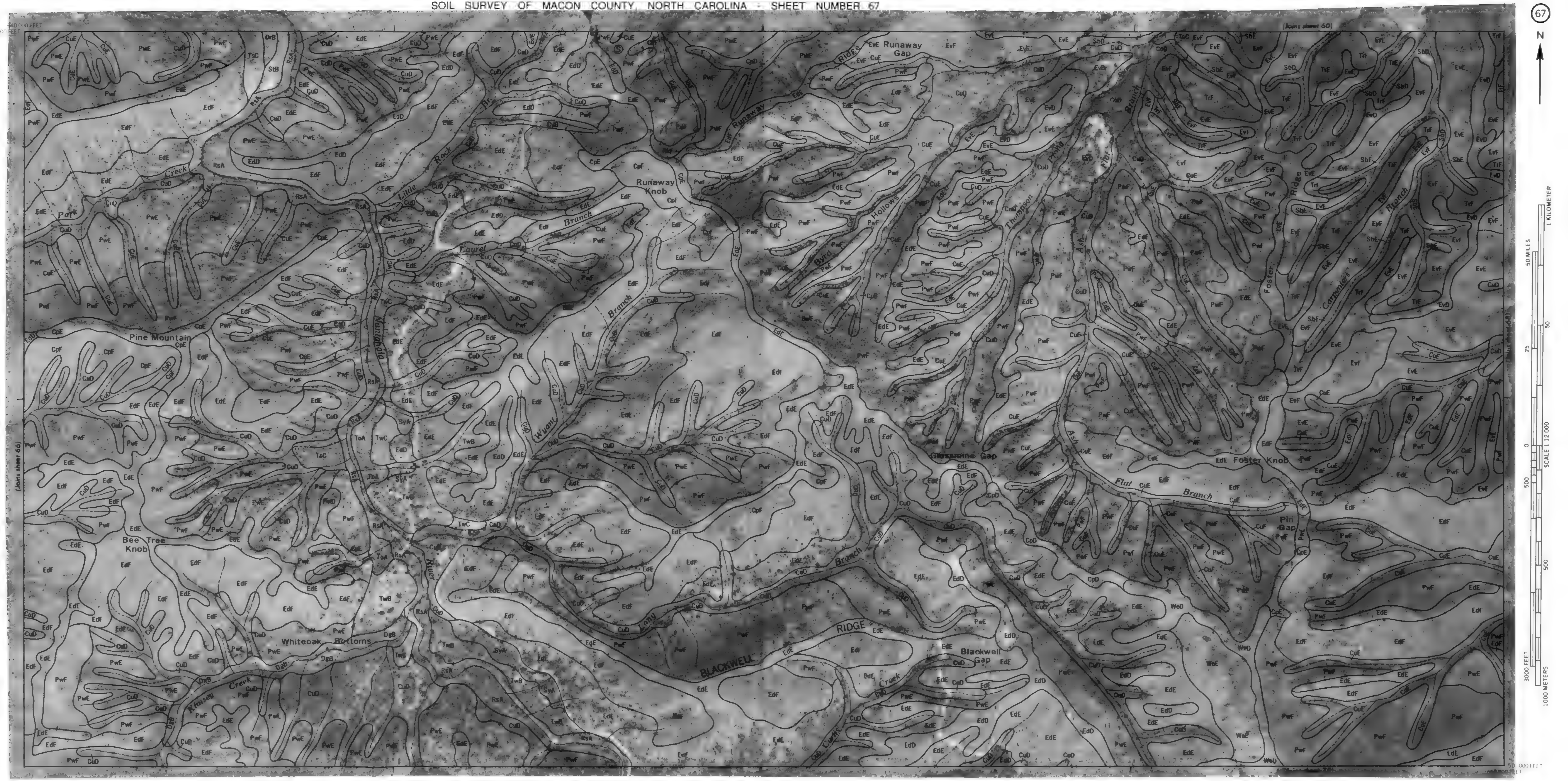




MACON COUNTY, NORTH CAROLINA NO. 66

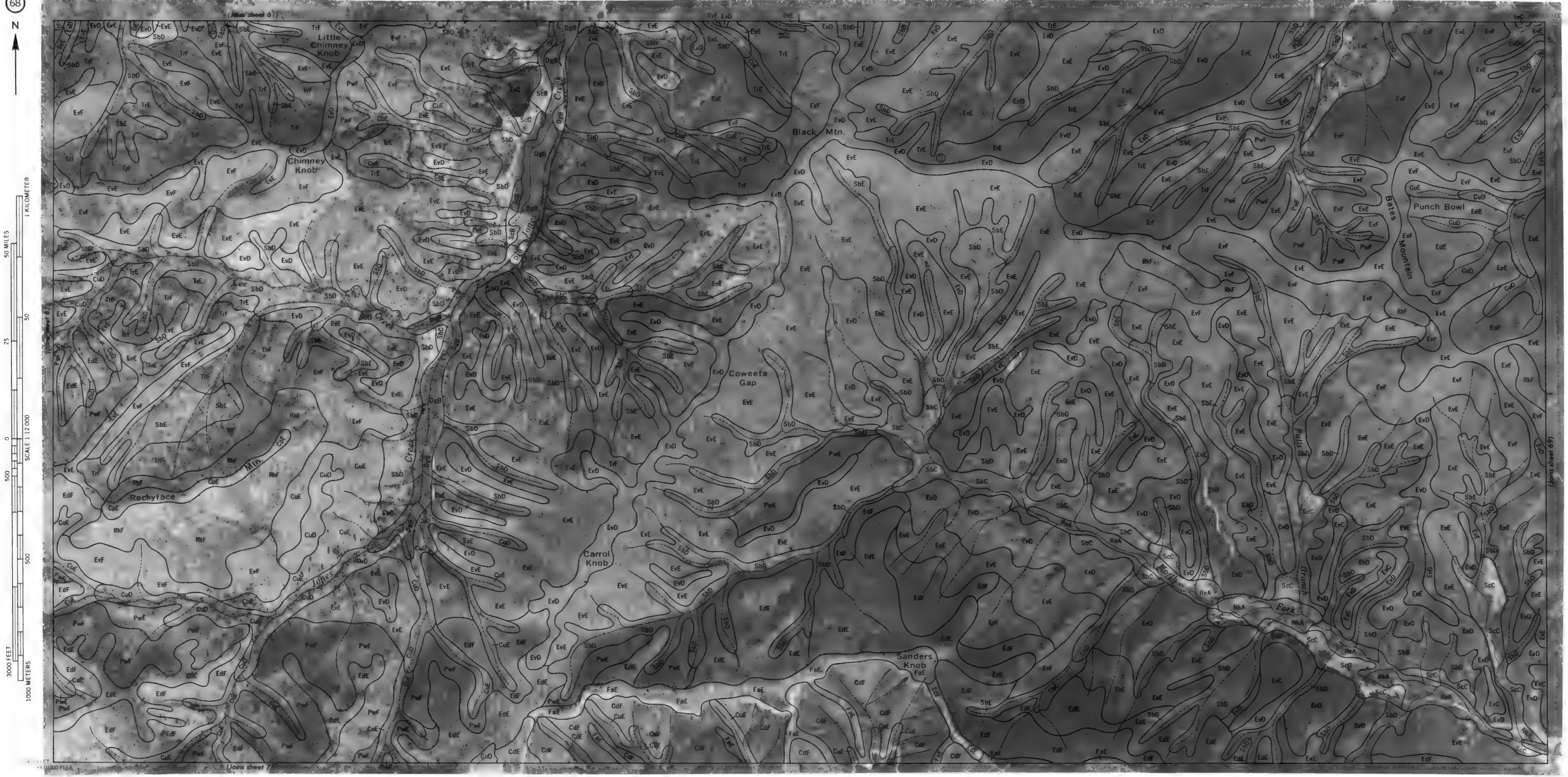
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

67



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MACON COUNTY, NORTH CAROLINA NO. 67

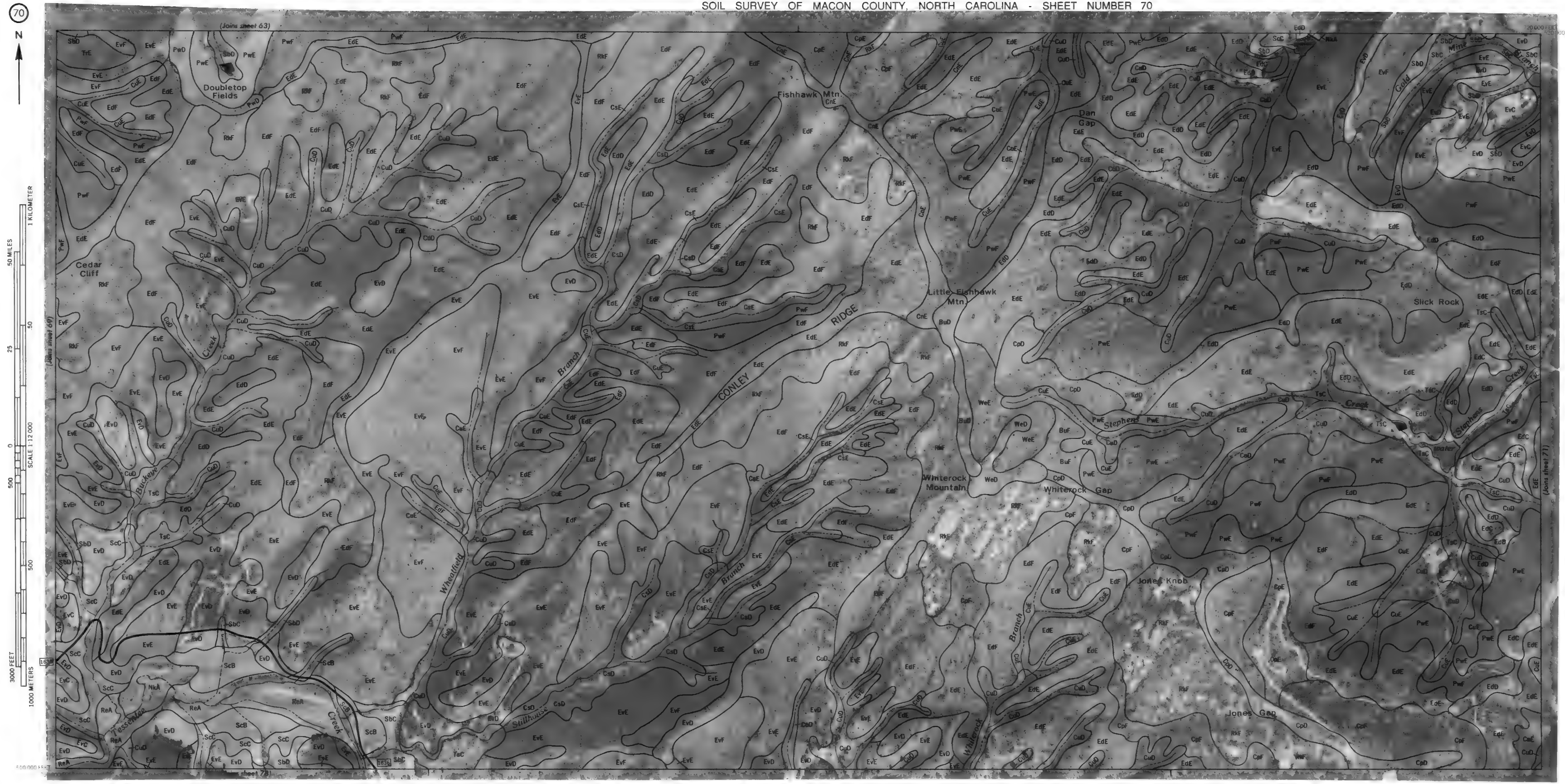


MACON COUNTY, NORTH CAROLINA NO. 68

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

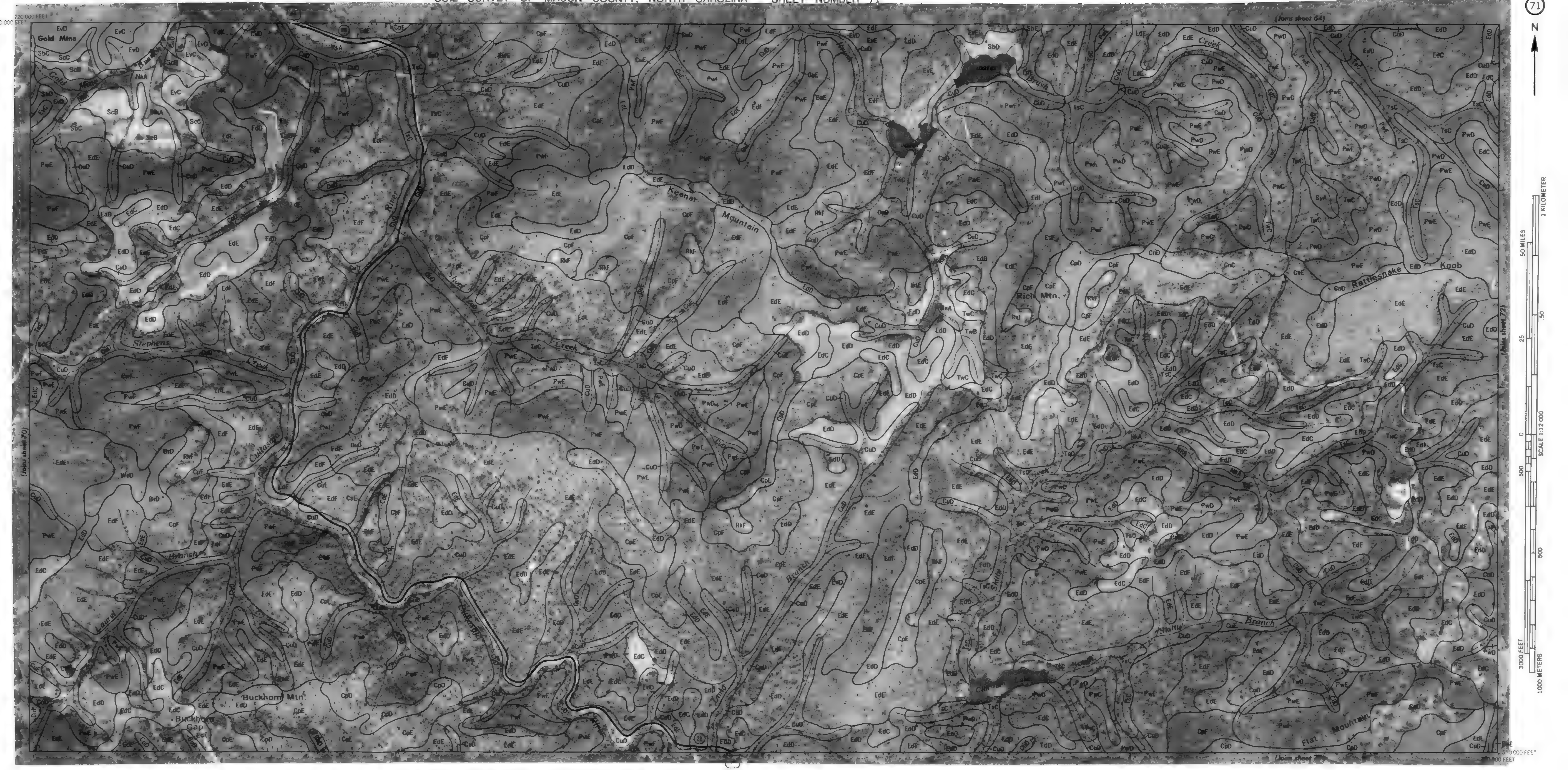
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MACON COUNTY, NORTH CAROLINA NO. 69



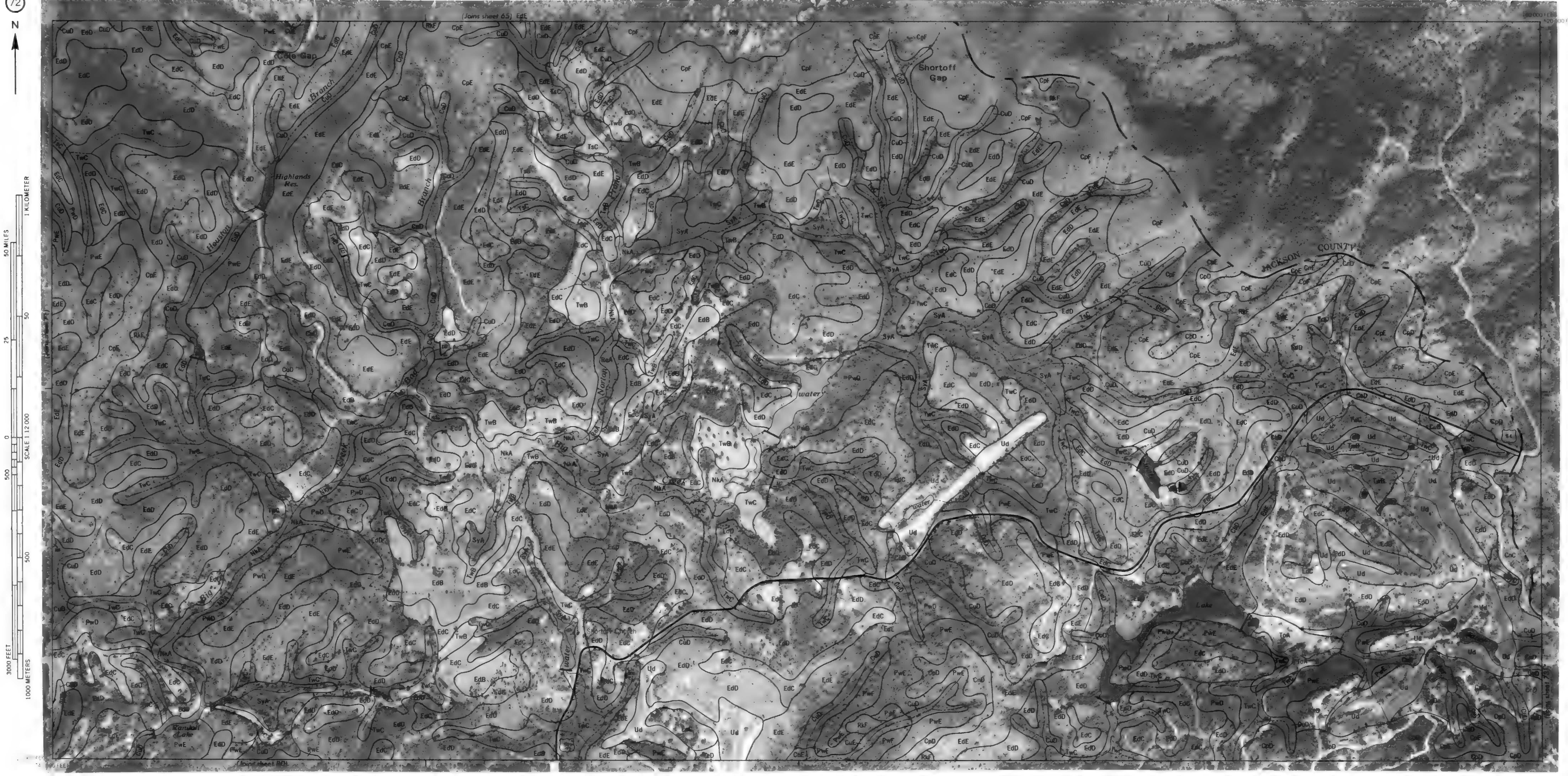
MACON COUNTY, NORTH CAROLINA NO. 70

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

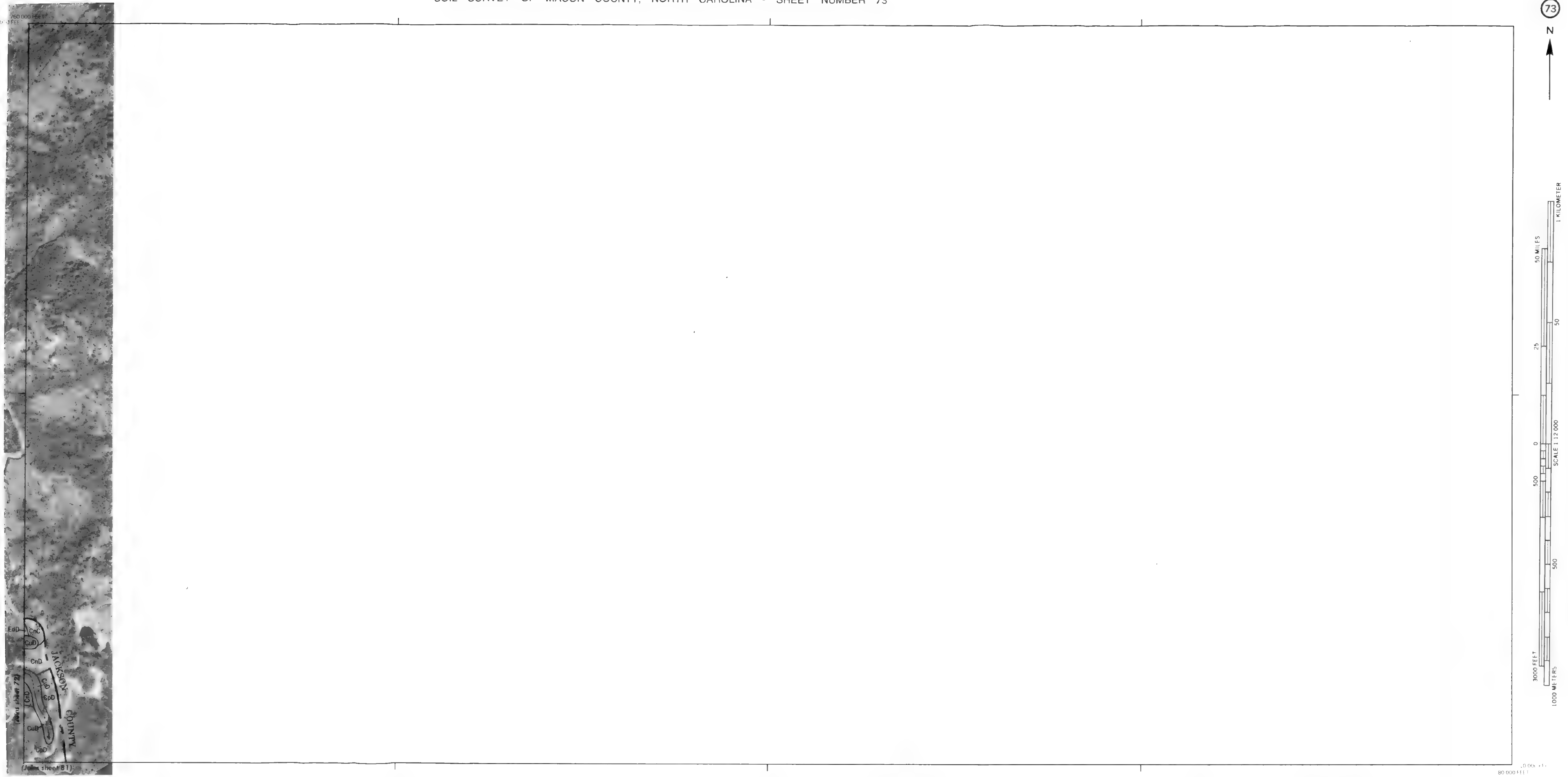
MACON COUNTY, NORTH CAROLINA NO. 71



MACON COUNTY, NORTH CAROLINA NO. 72

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

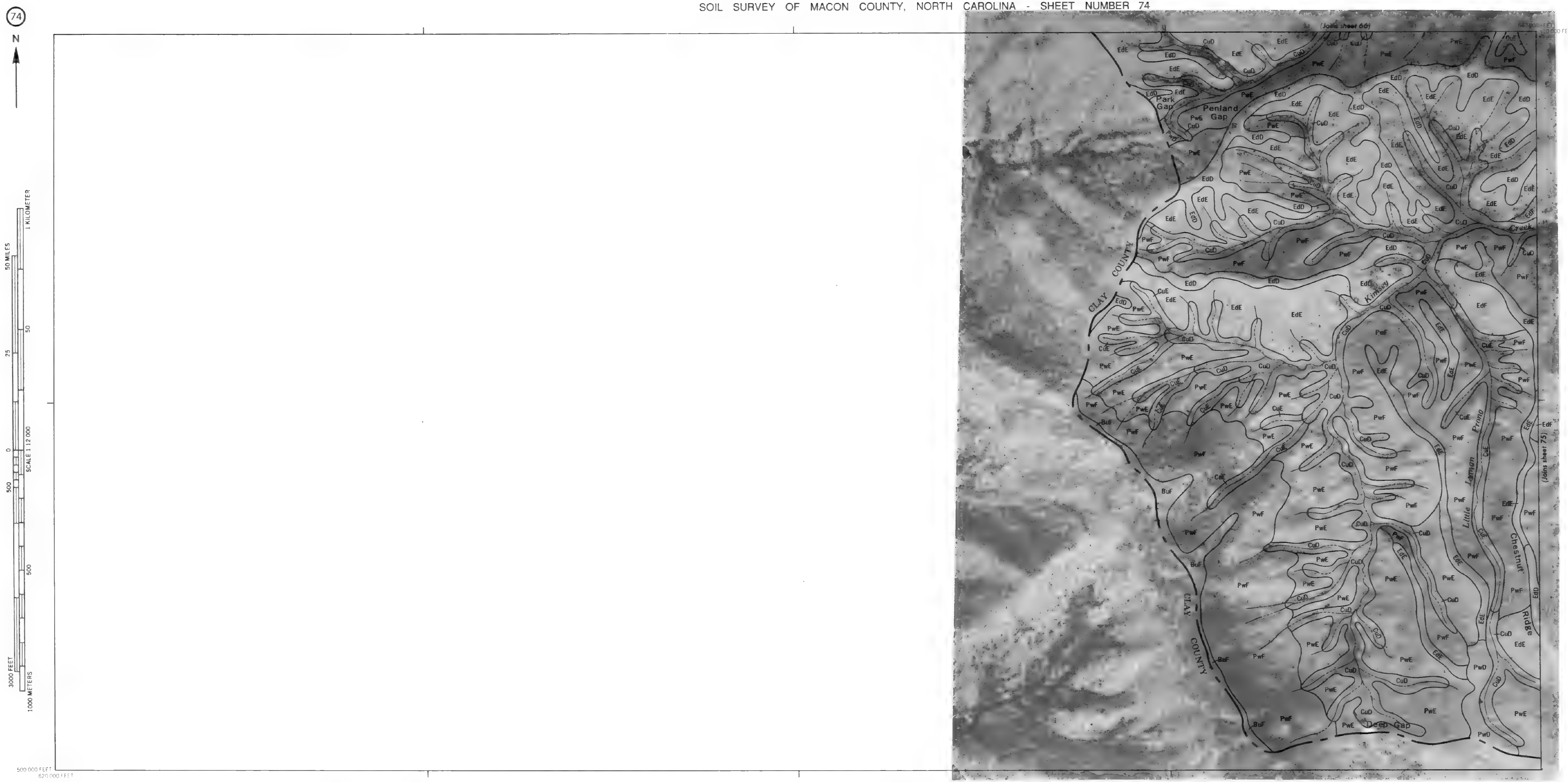
73



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MACON COUNTY, NORTH CAROLINA NO. 73

74



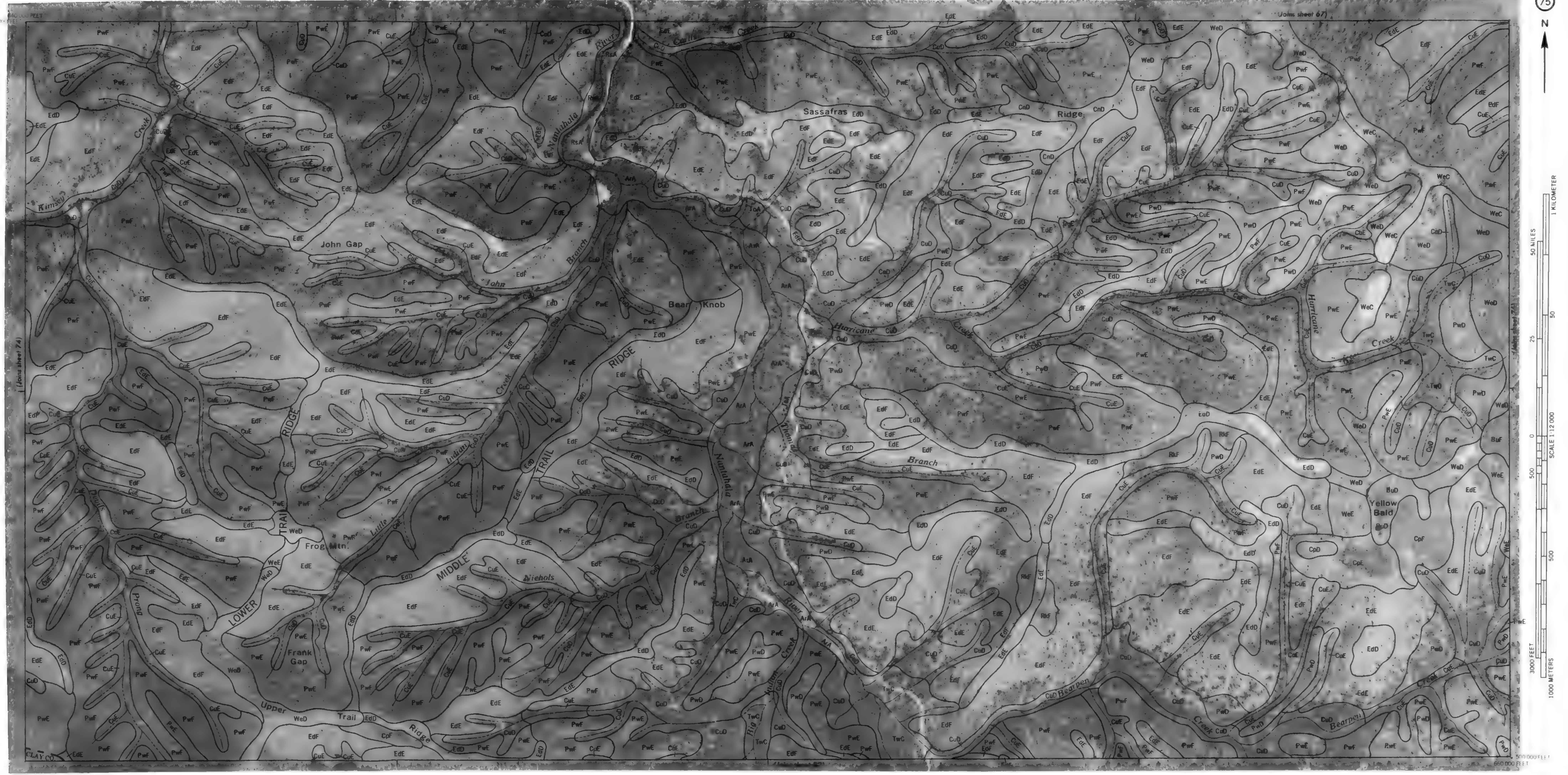
MACON COUNTY, NORTH CAROLINA NO. 74

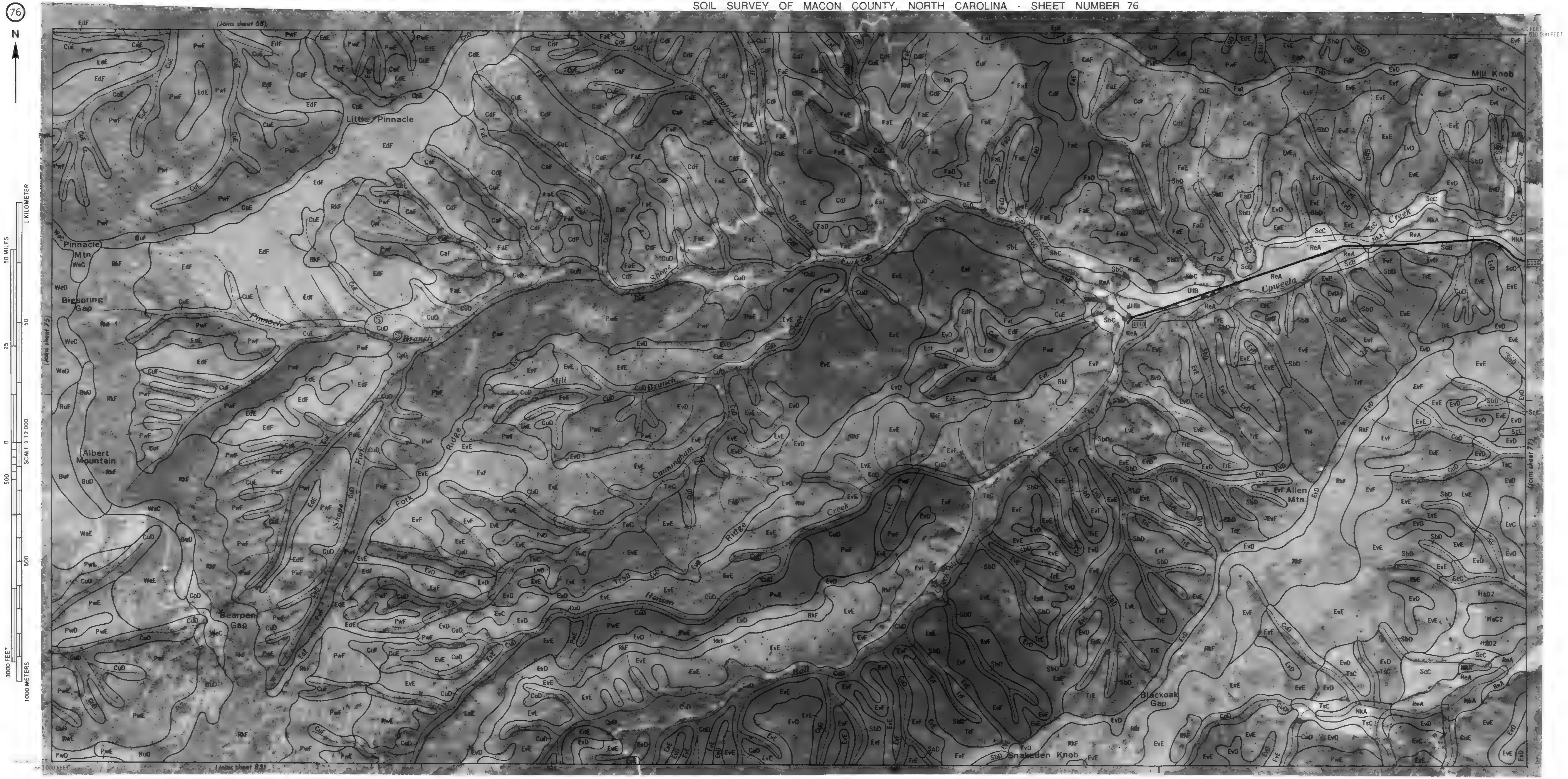
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

(75)

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MACON COUNTY, NORTH CAROLINA NO. 75





MACON COUNTY, NORTH CAROLINA NO. 76

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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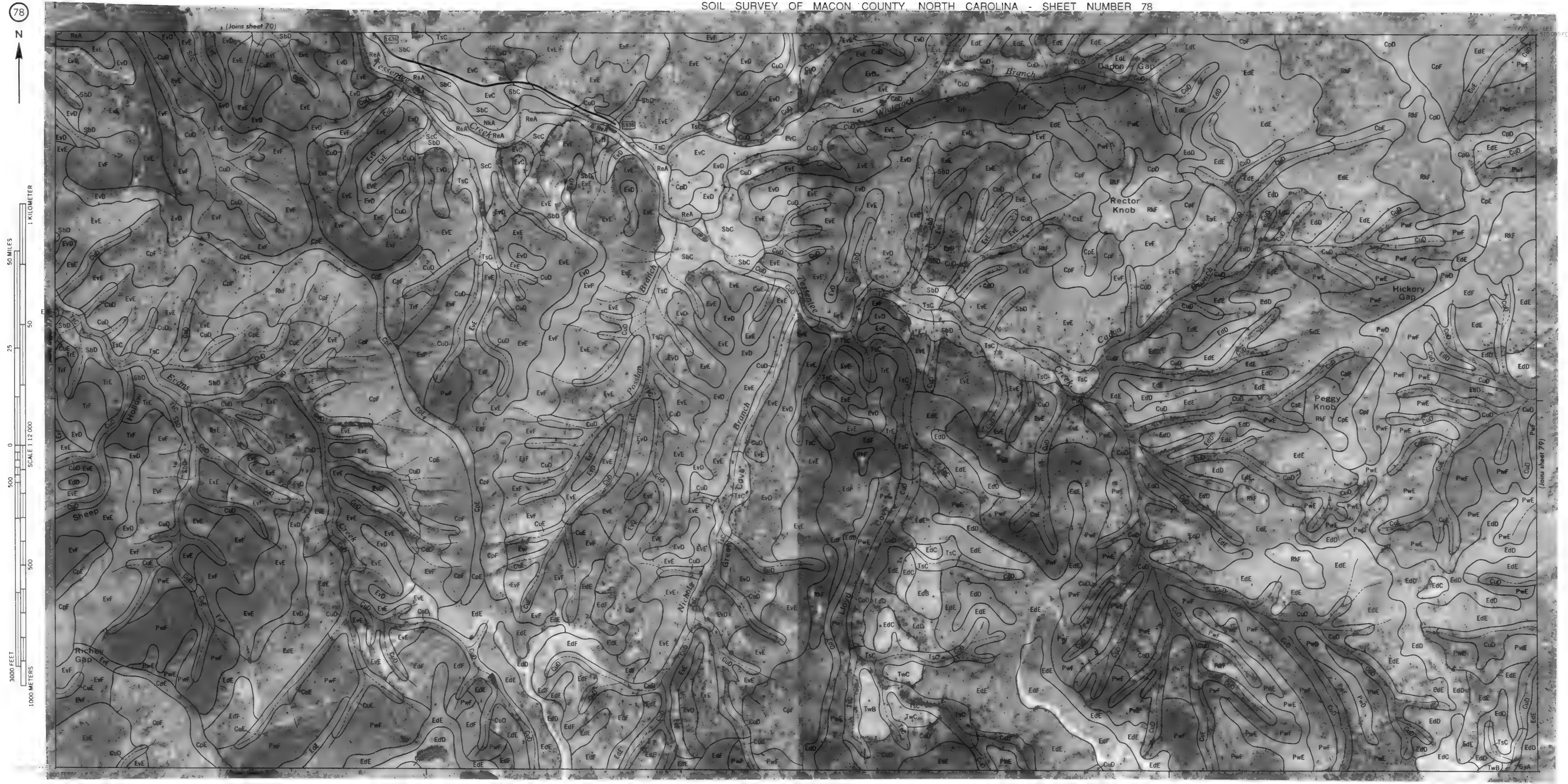
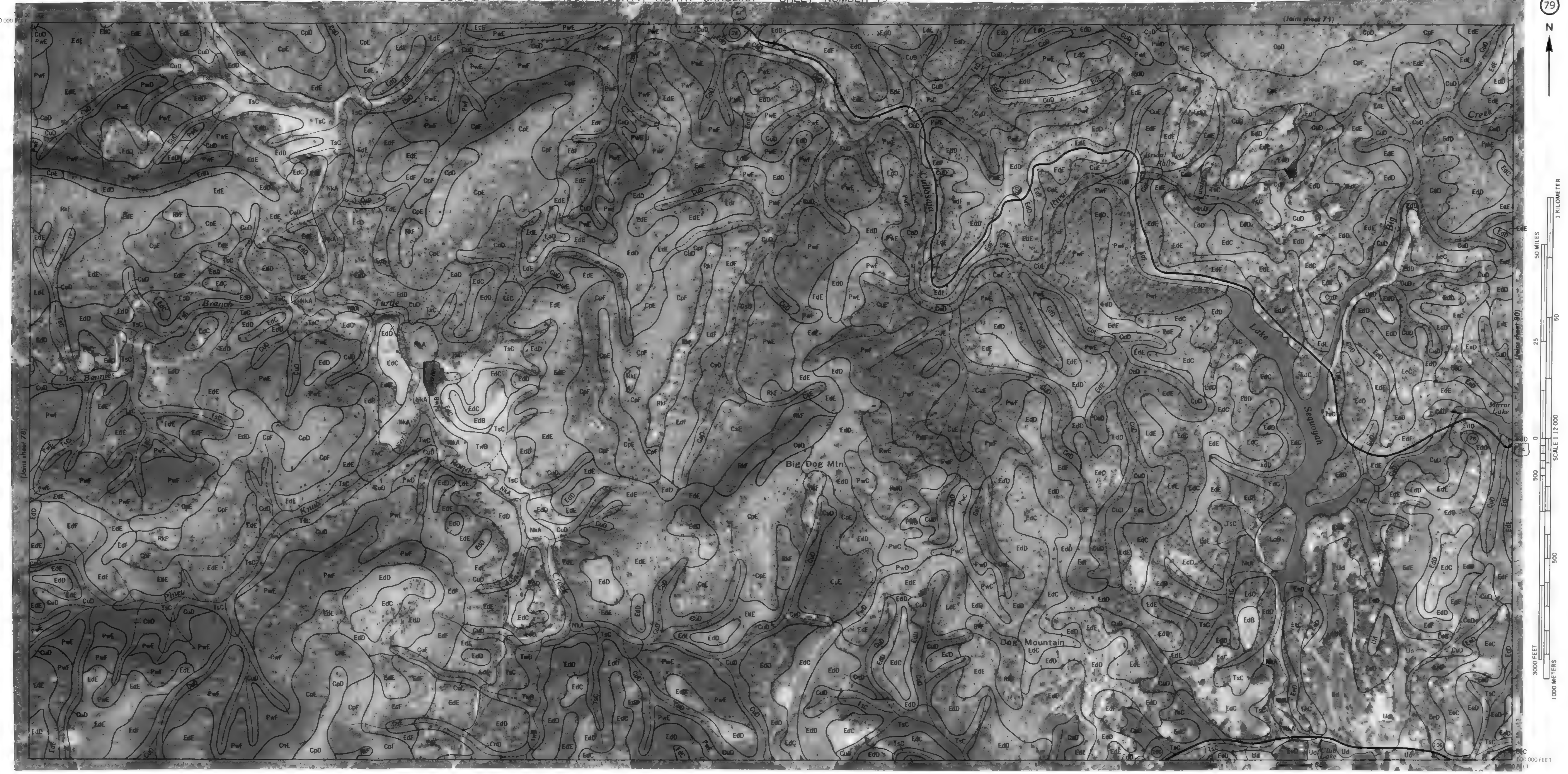
MACON COUNTY, NORTH CAROLINA NO. 77



MACON COUNTY, NORTH CAROLINA NO. 78

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



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MACON COUNTY, NORTH CAROLINA NO. 79

MACON COUNTY, NORTH CAROLINA NO. 80

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81

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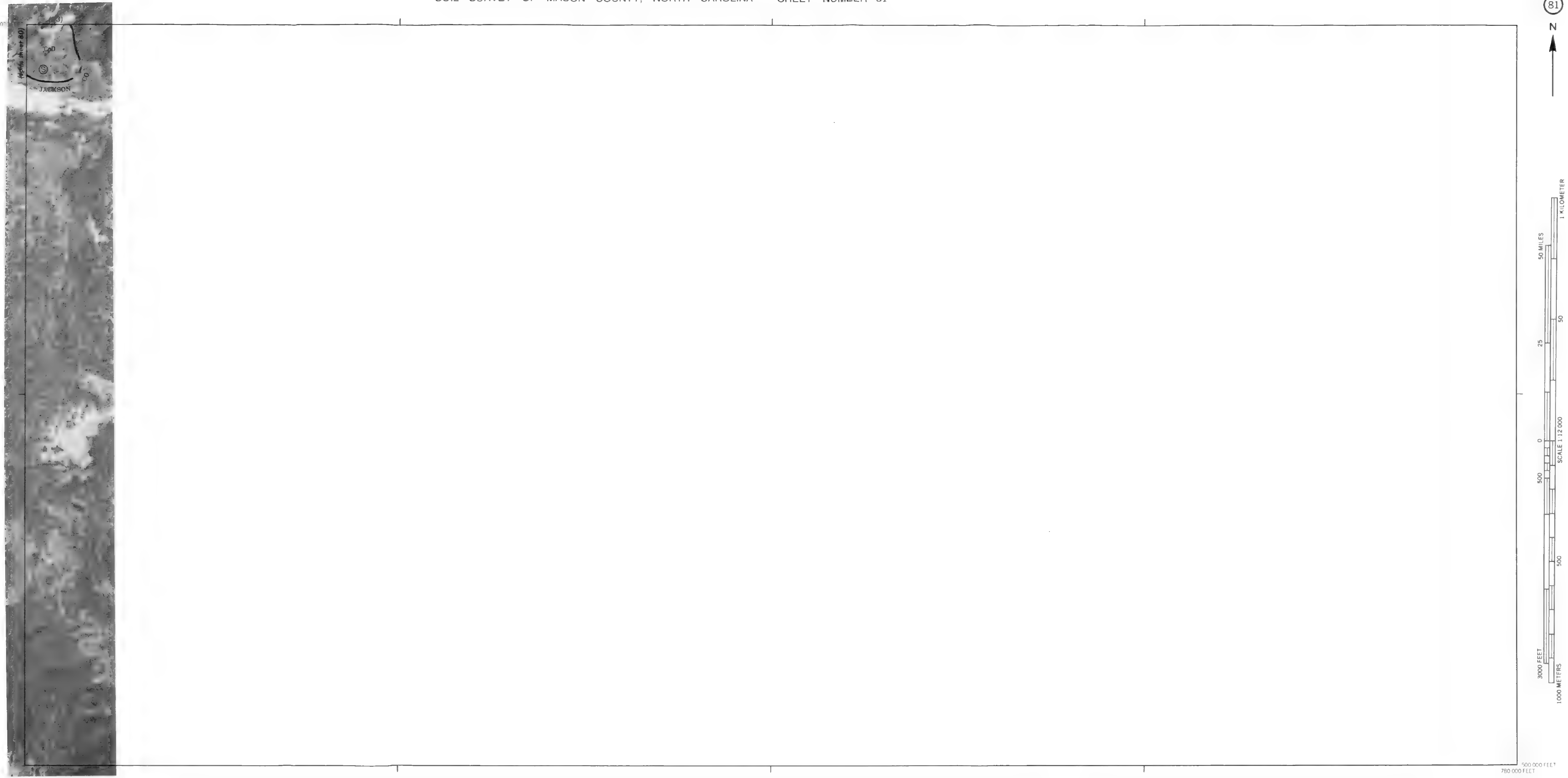
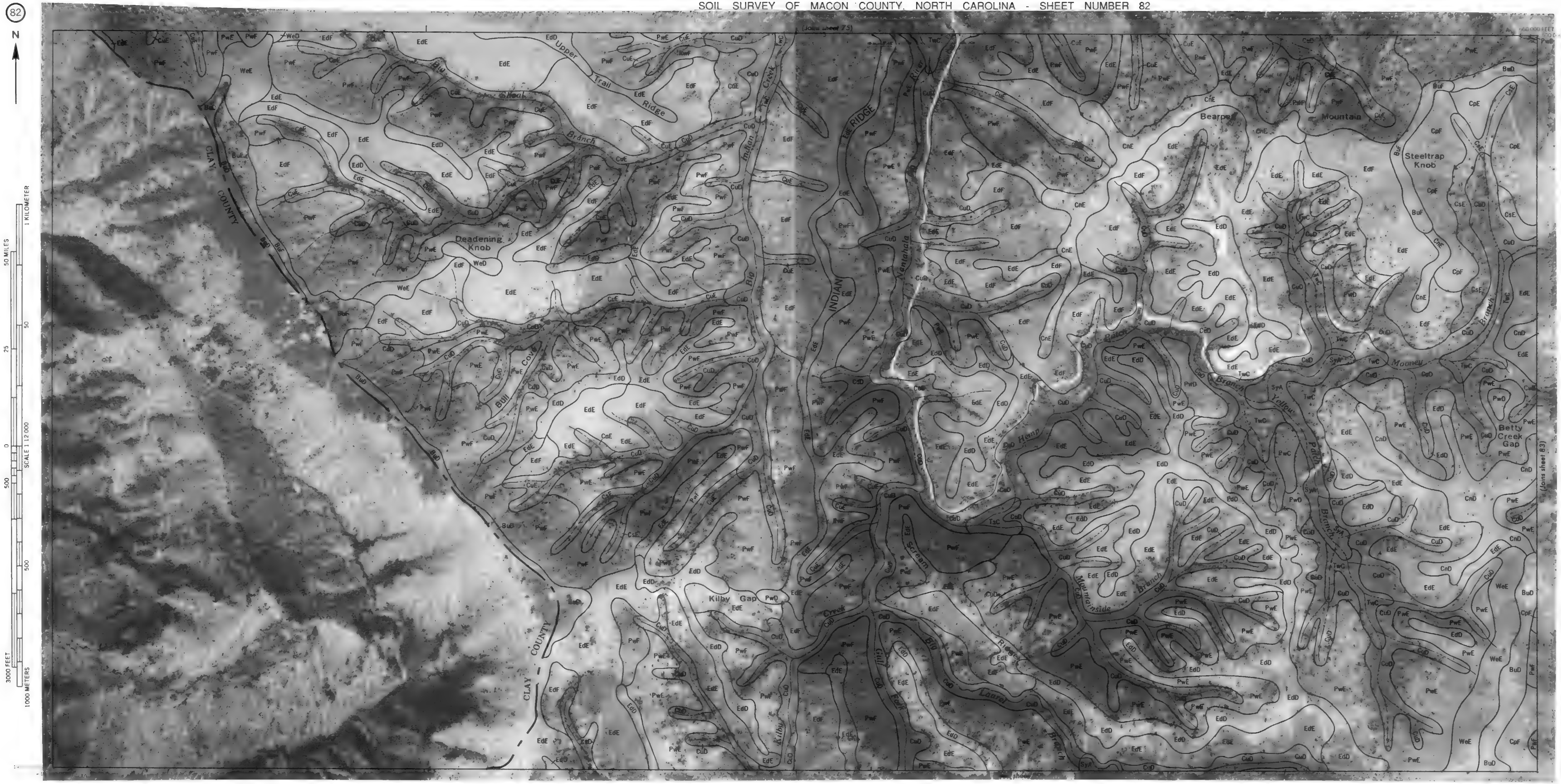
MACON COUNTY, NORTH CAROLINA NO. 81



SOIL SURVEY OF MACON COUNTY, NORTH CAROLINA - SHEET NUMBER 82



MACON COUNTY, NORTH CAROLINA NO. 82

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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MACON COUNTY, NORTH CAROLINA NO. 83

SOIL SURVEY OF MACON COUNTY, NORTH CAROLINA - SHEET NUMBER 84

MACON COUNTY, NORTH CAROLINA NO. 84

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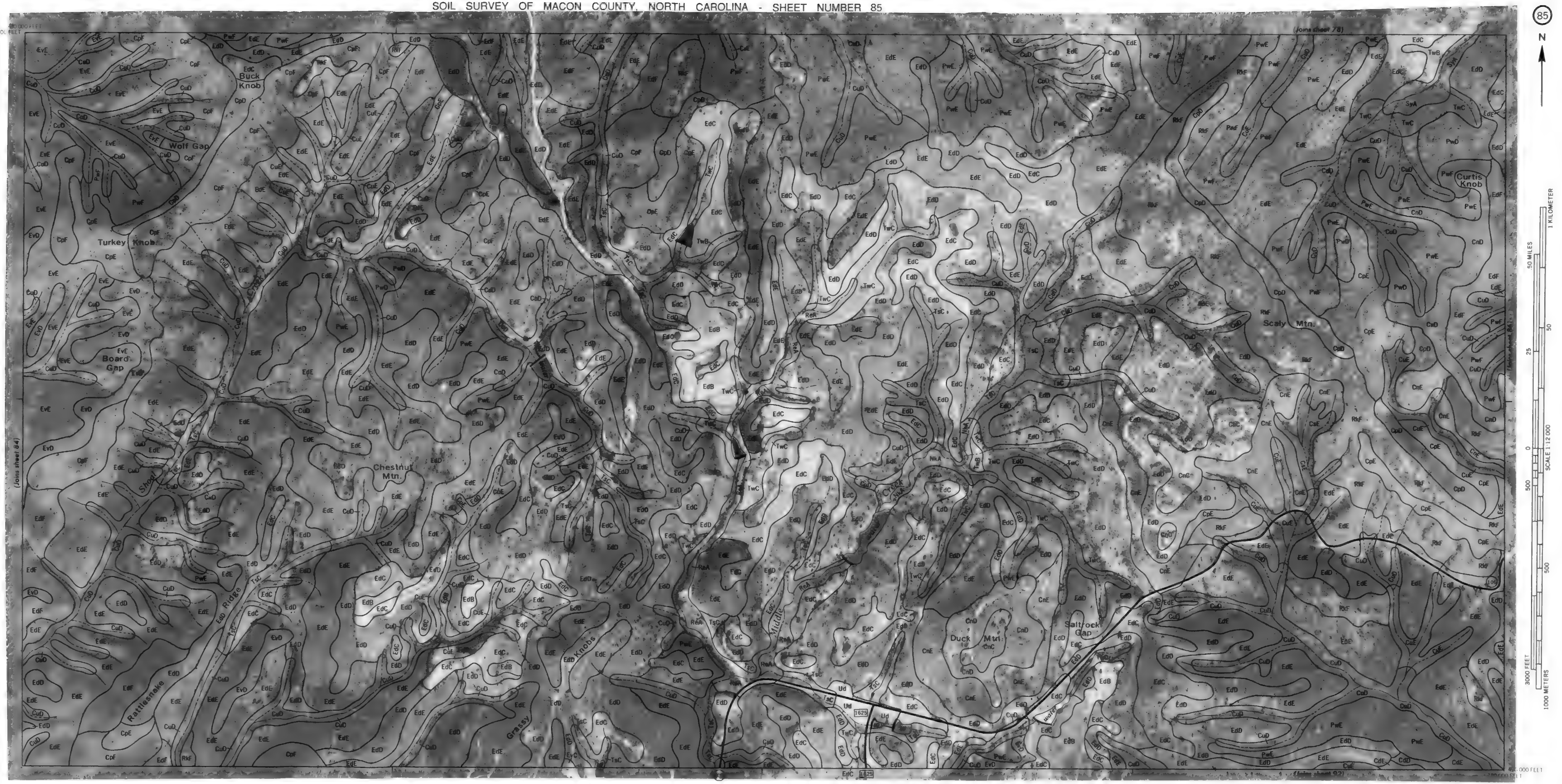

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
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MACON COUNTY, NORTH CAROLINA NO. 85

MACON COUNTY, NORTH CAROLINA NO. 86

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MACON COUNTY, NORTH CAROLINA NO. 87

MACON COUNTY, NORTH CAROLINA NO. 88

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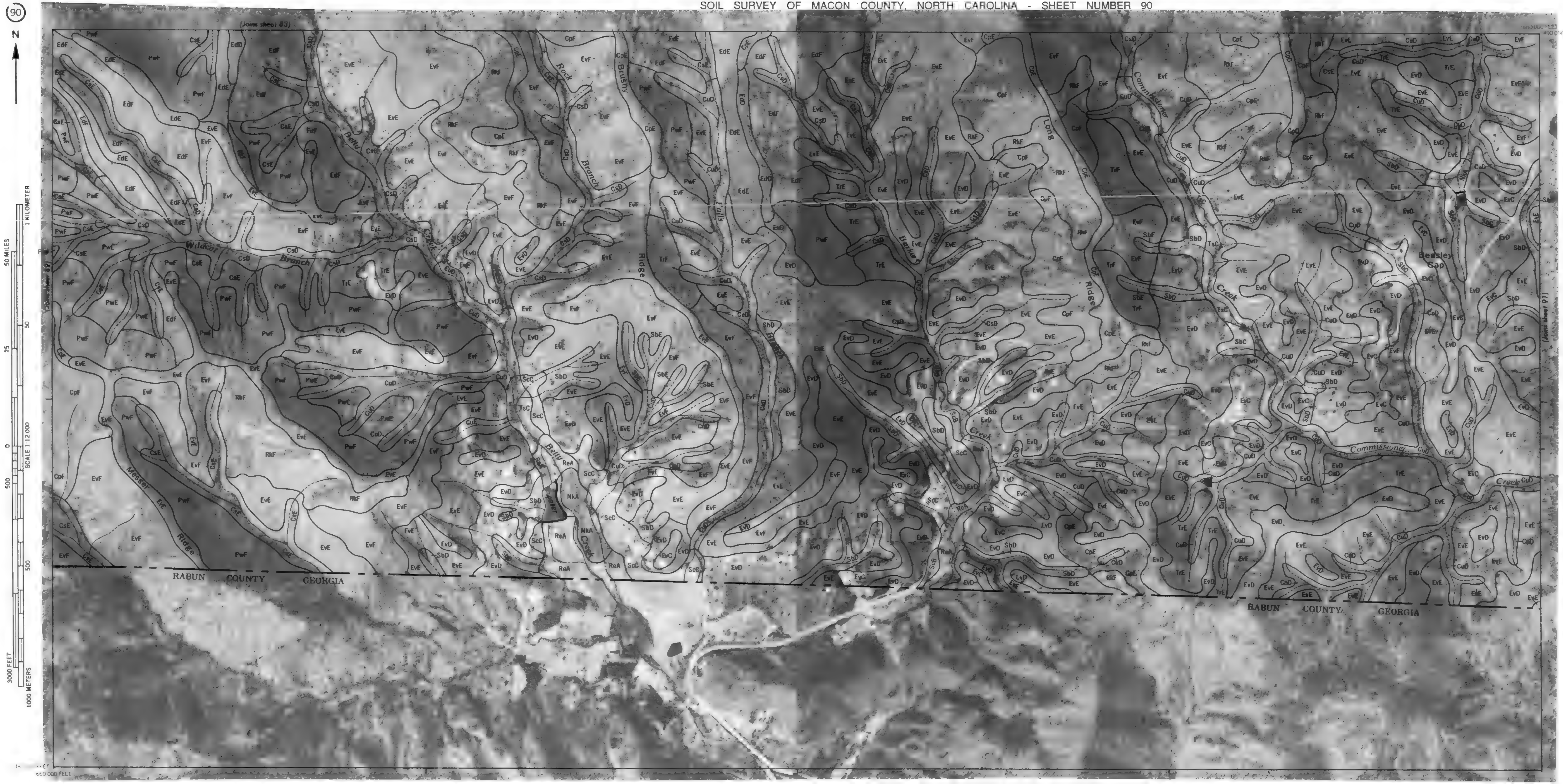
MACON COUNTY, NORTH CAROLINA NO. 89



MACON COUNTY, NORTH CAROLINA NO. 90

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
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MACON COUNTY, NORTH CAROLINA NO. 91

MACON COUNTY, NORTH CAROLINA NO. 92

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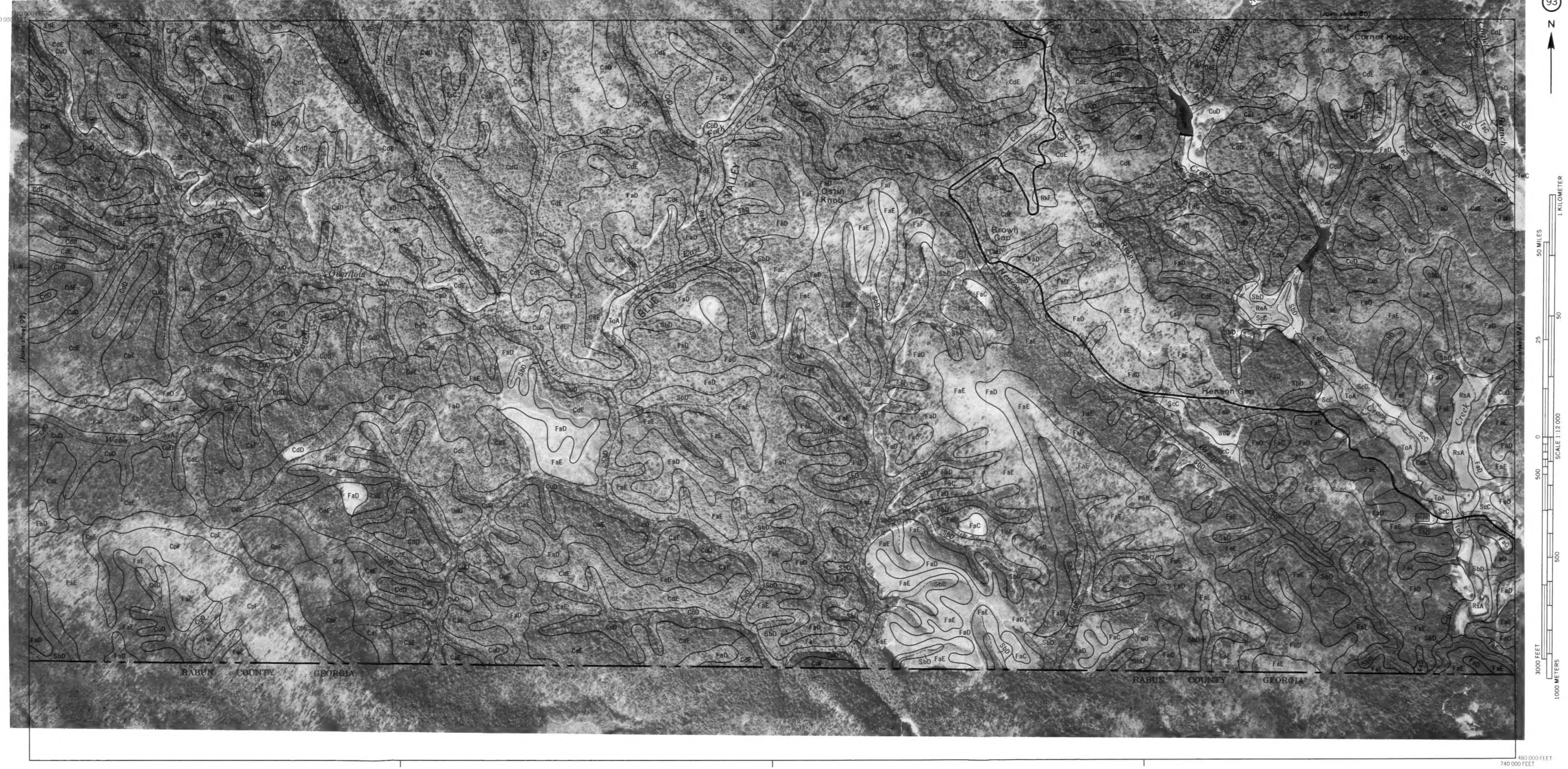
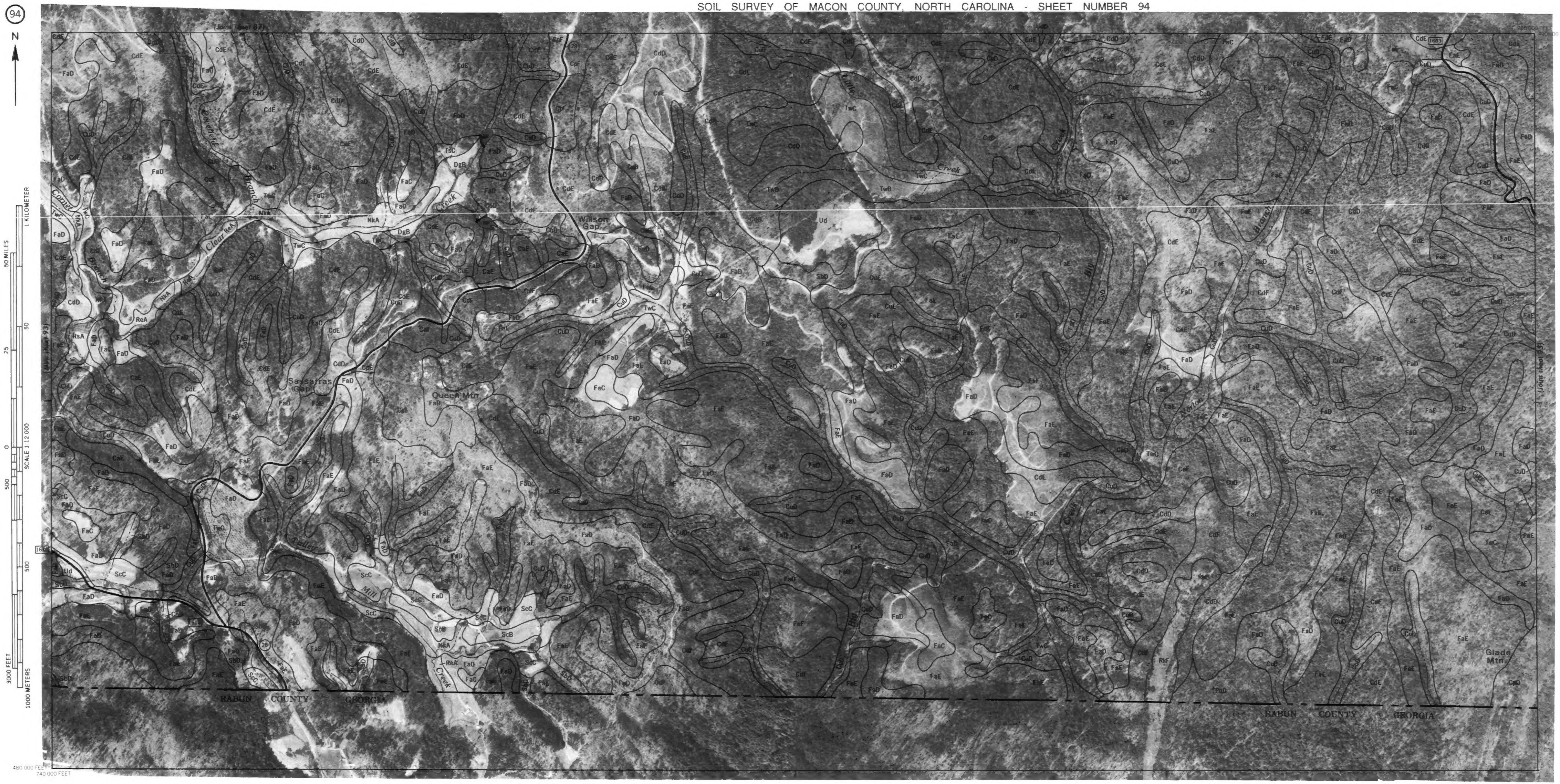


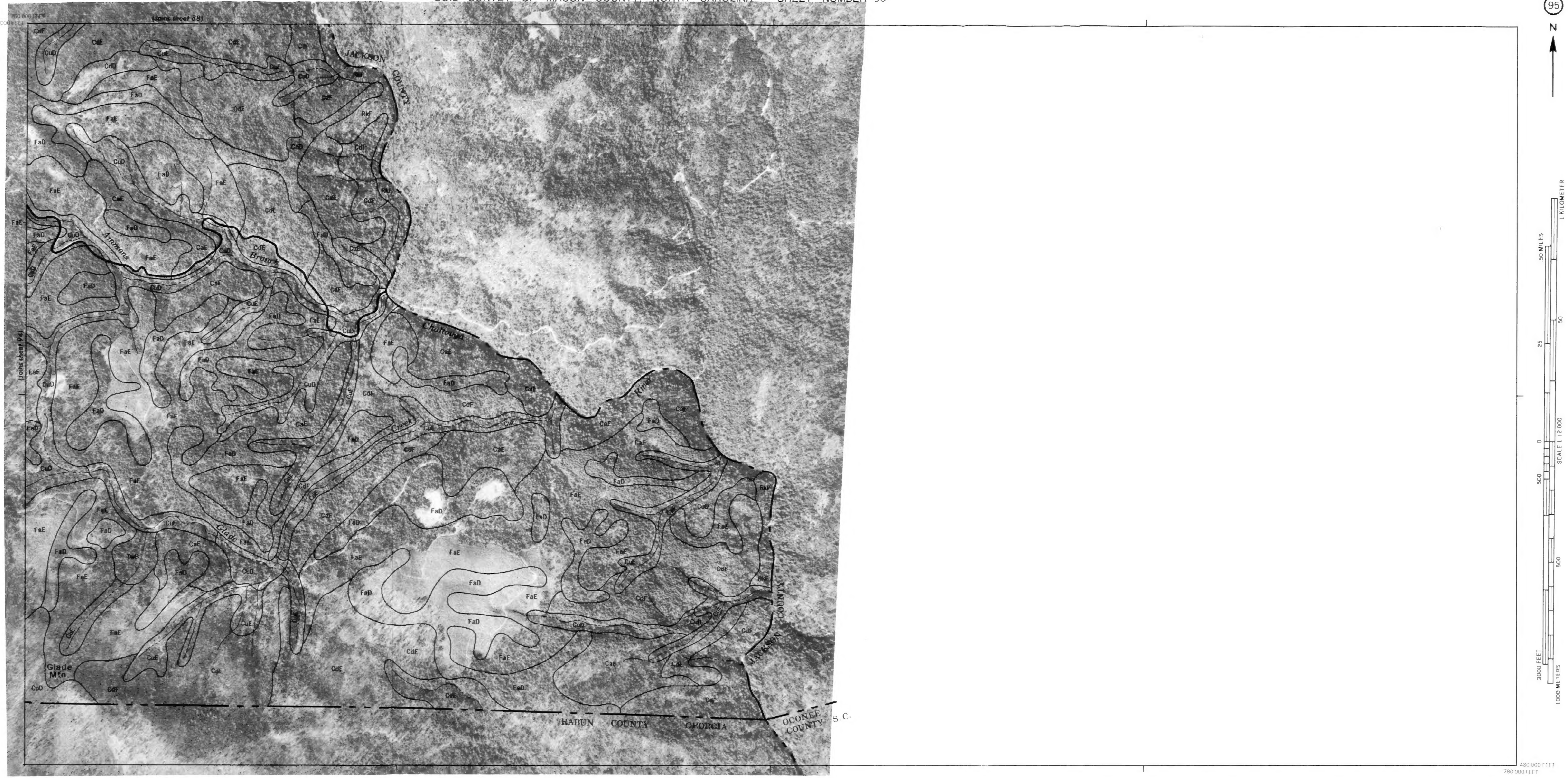
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MACON COUNTY, NORTH CAROLINA NO. 93



MACON COUNTY, NORTH CAROLINA NO. 94

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey from 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.
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